DOCUMENT RESUME

ED 198 881 JC 810 168

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TITLE Horticulture Technology: A Competency-Based Curriculum Manual.
INSTITUTION North Carolina State Dept. of Community Colleges, Raleigh.
PUB DATE Jun 79
NOTE 1,189p.

EDRS PRICE MF09/PC48 Plus Postage.
DESCRIPTORS *Agricultural Education; *Competency Based Education; Course Content; Course Descriptions; Course Objectives; Curriculum Development; Educational Facilities; *Horticulture; Instructional Materials; *Job Analysis; *Occupational Information; State Curriculum Guides; *Task Analysis; Teacher Selection; Two Year Colleges; Vocational Education
IDENTIFIERS *North Carolina

ABSTRACT

This three-chapter guide was the result of a curriculum development project undertaken by the North Carolina Department of Community Colleges to align vocational curricula with valid, on-the-job performance requirements. It outlines a suggested curriculum designed to train individuals for career opportunities in horticulture. Chapter I describes project activities, including a survey of horticulture occupational programs; a survey of nursery workers in North Carolina to identify career opportunities in the field; the development and validation of a list of tasks for each career opportunity; and an analysis of each task to determine the necessary knowledge, skills, and attitudes to complete it. Chapter II presents job descriptions and associated tasks for 16 entry- and advanced-level positions within the horticulture field. Chapter III contains the curriculum guide, providing: (1) a suggested series of courses for a seven-quarter period; (2) brief descriptions of these courses; (3) a list of electives for Horticulture Technology students; (4) guidelines for faculty and staff selection and certification; (5) guidelines for facilities, equipment, and instructional aids; and (6) 19 course outlines which specify prerequisites, performance objectives, course content, and suggested texts. Extensive appendices outline survey results and detail the competencies and criterion measures associated with identified tasks. (JP)

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HORTICULTURE TECHNOLOGY
A COMPETENCY-BASED CURRICULUM MANUAL

June, 1979

Coordinated by
Coy L. Hudson
Department of Community Colleges

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PROGRAM DEVELOPMENT DIVISION
DEPARTMENT OF COMMUNITY COLLEGES
RALEIGH, NORTH CAROLINA

FOREWORD

Horticulture Technology - A Competency-Based Curriculum Manual was designed utilizing a competency-based curriculum model to determine specific employment requirements of graduates entering the horticulture industry. The materials contained in this manual were developed, reviewed, and approved by community college and technical institute horticulture instructors and industry employers and employees.

The curriculum manual should be used by institutions in the North Carolina Community College System to update their current horticulture technology programs and by institutions planning to offer new horticulture technology programs. Specifically, this manual may be used to:

- Identify specific employment opportunities in the horticulture technology industry for graduates.
- Determine knowledge, skills, and attitudes required of individuals for successful entry into and advancement in the horticulture industry.
- Determine actual competencies obtained by students enrolled in the horticulture technology program.
- Enhance exit and entry from one program to another within an institution and from one institution to another based on competency levels obtained by students.

Following the guidelines in this manual with the assistance of a local advisory committee and the State Horticulture Advisory Committee, institutions should be able to implement effective programs that provide qualified personnel for the horticulture industry.

Roger G. Worthington

Roger G. Worthington, Director
Program Development Division

Charles R. Holloman

Dr. Charles R. Holloman
Senior Vice-President in Charge
Department of Community Colleges

DATES:

State Board of Education
Approval: ________________

Compliance: ________________

Curriculum Standards

STATE BOARD OF EDUCATION
NORTH CAROLINA DEPARTMENT OF COMMUNITY COLLEGES
RALEIGH, NORTH CAROLINA

PROGRAM AREA

AGRICULTURE AND NATURAL RESOURCES OCCUPATIONS

CURRICULUM CODE & TITLE

T-009 Horticulture Technology

CURRICULUM DESCRIPTION

The Horticulture Technology curriculum encompasses the study and practical application of many varied subjects in the field of horticulture. The curriculum consists of identifying and selecting plant materials; propagating, planting, and growing plants; designing basic landscapes and planting materials at the appropriate places and in the correct manner; properly maintaining plant materials; and managing the nursery, greenhouse, and garden center. In addition, skills are developed in designing and building planters, walks, patios, fences, and other landscape features. The curriculum is designed to provide students with the knowledge, skills, and attitudes that are necessary for independent, creative thinking essential to success in this field.

Various types of employers hire the graduates of this curriculum. Examples are nurseries, greenhouse operations, garden centers, landscape contractors, landscape maintenance companies, and municipal governmental agencies. The employee is usually required to carry out various responsibilities, depending upon the needs of the employer.

JOB OPPORTUNITIES

Entry Level

- Landscape Worker
- Nursery Worker
- Plant Propagator
- Tree Pruner
- Groundskeeper
- Greenhouse Worker
- Salesperson, Horticultural and Nursery Products
- Landscape Construction Worker
- Garden Center Worker
- Lawn-Service Worker

Advanced Level

- Horticulture - Specialty Grower, Field
- Horticulture - Specialty Grower, Inside
- Landscape Gardener
- Nursery Manager
- Greenhouse Superintendent
- Landscape Drafter

CURRICULUM STANDARDS

	MINIMUM/MAXIMUM RANGE OF QUARTER HOUR CREDITS			
	Technical	Technical Specialty	Vocational	Vocational Specialty
TECHNICAL/VOCATIONAL (MAJOR)	52-65			
Facility and Equipment Maintenance and Repair				
Garden Center Operation				
Greenhouse Production				
Landscape Construction				
Landscape Design				
Landscape Maintenance				
Landscape Preparation and Planting				
Nursery Production				
Plant Identification and Cultural Requirements				
Propagation Techniques				
RELATED	24-34			
Agricultural Chemicals				
Business Mathematics				
Chemistry				
Plant Science				
Soils and Fertilizers				
Business Management				
GENERAL EDUCATION	18-24			
English				
Social Science				
ELECTIVES	3-9			
COOPERATIVE EDUCATION/INTERNSHIP	0-8			
RANGE OF QUARTER HOUR CREDITS				
MIN.	108			
MAX.	119			
MINIMUM PERCENTAGE OF QHC AWARDED AS CLASS QH CREDITS	70%			
APPROVED FOR AWARDING	AAS			

ACKNOWLEDGEMENTS

Special thanks and appreciation are extended to the many individuals who contributed to the development of this project.

The curriculum committee made up of community college and technical institute horticulture instructors met numerous times during the past two years to develop the basic content of the manual. The project could not have been completed without their interest and dedication to the project. Special recognition is extended to these committee members.

Harold Atkins	Forsyth Technical Institute
Dave Carson	Haywood Technical Institute
Dr. Walter Croom	Fayetteville Technical Institute
Ed Duren	Wayne Community College
Darrell Kiser	Catawba Valley Technical Institute
Ed Merritt	Piedmont Technical Institute
John Sanders	Lenoir Community College
Bob Sherman	Fayetteville Technical Institute

Numerous horticulture employers and employees responded to questionnaires to validate the work of the curriculum committee. To these individuals many thanks are given for taking the time and effort to respond to forms and surveys that took time away from their regular duties and responsibilities.

To Mr. Lanny Thomas and Mrs. Mary Peele who revised most of the task analyses developed by the curriculum committee, appreciation is expressed for their valuable contributions.

A most sincere appreciation is expressed to the State Horticulture Advisory Committee for assisting with this project as well as for the tremendous amount of time and effort that the committee members have given to insure that our horticulture curriculum offerings are of high quality and meet industry needs. A personal thank you is expressed to the industry representatives listed below who are members of this committee.

George Brannan	Holt Lake Nursery
Lester Brown	Lester Brown Nursery
Tom Cannon	North Carolina State University
Ronald Copeland	Apex Nursery
Nat Dixon	Dixon's Nursery
G. B. Garza	Fayetteville
Tom Gilmore	Gilmore Plant and Bulb Company
Ralph Graham	Richard Bell & Associates
Harold Graves	Graves Nursery
R. E. Mewborn, Jr.	Live Oak Nursery
Hugh Smith	Smith's Nursery
Frank Stump	MacGregor Downs

A special thank you and recognition is given to Mrs. Laurel Pearce for assisting in setting up the many meetings of the curriculum committee, for typing the materials for the manual, and for providing assistance in decision making and other matters.

The cover design for this publication was developed by William F. Pugh, Artist Illustrator, Department of Community Colleges. His talents and the work devoted to this design are greatly appreciated.

Finally, special appreciation is expressed to Mrs. Linda Horton who edited the manual and to Mr. Roger Worthington who provided many helpful suggestions and much encouragement.

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CHAPTER I

INTRODUCTION

The need for training horticulture technicians became evident in the middle sixties as people became more conscious of the environment and with using plants for beautifying homes, commercial facilities, and highways. Employment opportunities became more numerous for trained personnel to meet the demands of the expanding industry. To meet this challenge, several institutions in the Community College System began to plan programs to prepare individuals for employment in the horticulture industry.

The first Ornamental Horticulture program was approved by the State Board of Education in the fall of 1965 at Forsyth Technical Institute. Several other institutions were approved to offer the program in the next several years. By the end of 1968 a total of five institutions were approved to offer Ornamental Horticulture. One additional program was approved in 1974.

By the early 1970's more specialization in the field of horticulture became evident. Training individuals in the general field of Ornamental Horticulture was not sufficient to meet industry needs. As a result of this growth and development several industry representatives in 1971 requested the Department of Community Colleges to investigate the possibility of developing several new programs in horticulture. To assist in this study a State Horticulture Advisory Committee was formed in January, 1972 composed of individuals representing all phases of the horticulture industry and horticulture instructors currently teaching in community colleges and technical institutes.

During the first two years of its existence, the State Horticulture Advisory Committee met approximately five times each year. Current horticulture program offerings were reviewed, suggested changes made, and new horticulture curriculum areas were explored. As a result of this intensive effort, several new horticulture curriculums were developed--a vocational Horticulture Diploma program, Horticulture Business Technology, and Orchard Management and Horticulture.

Since the initial intensive effort by the Horticulture Advisory Committee, the committee has reduced its number of meetings per year to approximately two. Much effort continues by the committee to keep operating programs up to date and to explore additional training needs. Several new horticulture programs are being developed as advancements are made in the industry. The two most recent programs, both developed in the spring and summer of 1978, are Landscape Construction and Contracting Technology and Landscape Management.

As a result of this project and the inclusion of additional aspects of horticulture in the Ornamental Horticulture curriculum, the name of the curriculum was changed to Horticulture Technology in the spring of 1979. In June, 1979, the State Board of Education approved two additional institutions to offer Horticulture Technology.

This manual is designed to aid institutions wishing to update the Horticulture Technology curriculum as well as for the institution initiating a curriculum to train persons in the nursery and landscaping industries. Items provided in the manual include a suggested curriculum by quarters, course descriptions, course outlines, task analyses, job competencies, equipment lists, and industry and institutional survey information. This information can be used in helping focus the instructional activities of the curriculum and in determining competencies of students, both graduates and early leavers.

The materials contained in this manual supersedes all previous materials published by the Department of Community Colleges concerning Ornamental Horticulture or Horticulture Technology.

Vocational/Technical Education Programs

The primary objective of vocational/technical education programs is to prepare individuals for employment in the occupations for which the programs are designed and developed. This education should be consistent with the ability, desire, and needs of the student; maintaining quality standards that are consistent with employment requirements.

Since the development of the Community College System, continuous concern and effort have been given to insuring the quality of programs, providing program guidelines, evaluating programs, improving the articulation process, and working with students, employers, and educators to determine student, business, industry, government, and service needs.

To further the development of quality vocational programs and articulation efforts between programs in the secondary schools and the community colleges and technical institutes, the North Carolina Advisory Council on Vocational Education in its 1975 Annual Report recommended the following:

> That the State Board of Education require that all vocational curricula designed to produce job entry skills be based on performance objectives validated by recent job analysis and task analysis and that parallel performance standards be established for completion of secondary and post-secondary programs, and that the State Board of Education immediately consider the most efficient, expedient method for attaining such a goal.

Competency-Based Curriculum Development Project

To begin implementation of the Advisory Council's recommendation and to continue and improve the development of quality vocational and technical curriculums, the Program Development Division Staff of the Department of Community Colleges in 1976 designed a competency-based curriculum project to develop competencies for the vocational and technical curriculums offered in the System. The project was developed to help alleviate the following continuing concerns about vocational/technical education:

1. A quality of instruction which makes it possible for individuals completing a curriculum or phase of a curriculum to be prepared for employment;

2. Articulation between secondary and post-secondary vocational/technical curriculums;

3. Involvement of employers, employees, and educators in curriculum development;

4. Assurance that curriculums are up to date in accordance with current job technology requirements.

Purpose of Project

The purposes of the project were identified as follows: (1) to describe the desired outcomes of occupational programs, (2) to provide guidance for increased consistency among programs, and (3) to provide mechanisms for improved articulation with secondary and post-secondary occupational programs.

The project was designed to provide: (1) a validated list of career opportunities for which each curriculum provides training and education; (2) the tasks performed by employees in each job; (3) a list of competencies and evaluative criteria essential to successfully perform in the job; (4) curriculum guidelines; and (5) curriculum materials based on the competencies.

Specifically, the project:

1. Identified each curriculum to be analyzed.
2. Identified resources for curriculum development.
3. Identified career opportunities for each curriculum.
4. Identified tasks performed in the job.
5. Analyzed each task to determine knowledges, skills, and attitudes.
6. Identified competency and level of competency for each task.
7. Provided evaluative criteria for each competency.
8. Provided information for development and/or revision of curriculum guidelines and materials for career mobility at the secondary and post-secondary levels of instruction.

Organization of Advisory Committees

The procedural plan for the development of the competency-based project called for the development of two committees to assist in developing each curriculum--a curriculum committee and a curriculum advisory committee.

The curriculum committee was made up of horticulture instructors from the community colleges and technical institutes. The Presidents of the various institutions that offer horticulture programs nominated instructors to serve on this committee. This working committee was responsible for assisting in the analysis, development, and validation of the total project. Specific duties of the committee members were to assist in identifying, listing, and validating career opportunities, job analyses, task analyses, competencies, and in writing curriculum guidelines and revising curriculum materials. The members of the curriculum committee are listed in Appendix A-1.

The curriculum advisory committee for this project was the already established State Horticulture Advisory Committee. This committee is composed of employers and employees representing the many facets of the horticulture industry plus horticulture instructors in the community colleges and technical institutes. The curriculum advisory committee provided specific advice on the curriculum and gave guidance and advice on job opportunities, job requirements, and educational needs for employment. A directory of the Curriculum Advisory Committee or State Horticulture Advisory Committee is included in Appendix A-2.

Methods and Procedures

The methods and procedures for the Horticulture Technology Competency-Based Project were integrated with the ones identified in the Program Development Competency-Based Project. The methods and procedures are described below:

PHASE I: A survey of occupational programs offered in the Secondary Schools and the Community Colleges/Technical Institutes to identify the curriculums to be selected.

Curriculum Selection. Horticulture Technology was selected because horticulture is an important vocational education program offered in the secondary schools and some development work had already been initiated by the State Horticulture Advisory Committee.

Research Study. A research study was conducted to search for curriculum materials available in Horticulture Technology.

1. The search included sources such as the ERIC System, Abstracts of Instructional Materials in Vocational and Technical Education (AIM), Abstracts of Research and Related Materials in Vocational and Technical Education (ARM), Current Indexes to Journals in Education (CIJE), and Research in Education (RIE).

2. Current materials from publishers were requested.

3. Educational institutions were surveyed for resources.

PHASE II: A survey of resources to determine career opportunities available in horticulture technology and validation of these careers.

Identification of Career Opportunities. Curriculum guides and manuals used in the community colleges/technical institutes and other publications identify career opportunities. These publications were reviewed to determine the careers available to students in horticulture technology and compared with occupations and programs in publications such as: the Dictionary of Occupational Titles, Vocational Education and Occupations, and Occupational Outlook Handbook.

Validation of Career Opportunities. The career opportunities identified were validated by a mail survey of a random sample of nurserymen who belong to the North Carolina Nurserymen's Association. Employers and employees were asked to respond to the survey form.

A copy of the Career Opportunity Survey Form and a summary of the validation data is included in Appendices B-1, B-2, and B-3.

PHASE III: An analysis of career opportunities to determine the tasks for accomplishing a job.

Job Analysis. The curriculum committee examined each career opportunity and developed a list of tasks.

Inservice Education. Inservice workshops were held for the curriculum committee to orient the committee members to the overall project and how to develop a task listing.

Task Survey. Employers and employees in the horticulture industry and horticulture instructors in the community colleges and technical institutes were surveyed to validate the identified tasks.

The task listing and task validation results are found in Appendices C-1, C-2, and C-3.

PHASE IV: A compilation of surveys by the horticulture curriculum committee to revise and prepare a complete list of tasks.

Survey Compilation. The curriculum committee revised and prepared a complete list of tasks to be analyzed.

PHASE V: An analysis of each task to determine the knowledge, skills, and attitudes for each job competency level.

Task Analysis. The curriculum committee examined each task to determine the knowledges, skills, and attitudes for each job competency level. Evaluative criteria was developed to determine the performance level of students for each competency. A copy of the competencies and evaluative criteria are listed in Appendix E and the task analyses are provided in Appendix F.

Inservice Education. Inservice education workshops for the curriculum committee were held to orient the committee on how to analyze tasks.

PHASE VI: Development of curriculum guidelines for career mobility.

Curriculum Guidelines Information. The curriculum committee and the State Horticulture Advisory Committee assisted in the development of curriculum guidelines or standards. The curriculum standards for Horticulture Technology are provided on page v at the beginning of this manual. Tasks required for the subject areas included in the curriculum standards are provided in Appendix D.

PHASE VII: Development and/or revision of curriculum materials based on the curriculum guidelines.

Curriculum Materials. The development and/or revision of existing curriculum materials was done with the assistance of the curriculum committee based on the results of the study, including the recommendations of the State Horticulture Advisory Committee. The materials were designed to provide assistance to instructors and administrators in implementing and teaching the horticulture technology curriculum. The following curriculum materials are included in Chapter III:

1. Curriculum Guide
2. Faculty and Staff Selection and Certification
3. Facilities, Equipment, and Instructional Aids
4. The Library
5. Professional Boards and Associations
6. Course Outlines

CHAPTER II

JOB DESCRIPTIONS/JOB COMPETENCIES

As indicated in the Methods and Procedures section in Chapter I, career opportunities for the Horticulture Technology curriculum were identified by examining various publications and then validated by surveying a random sample of industry personnel who are members of the North Carolina Nurserymen's Association. A list of the validated entry level and advanced level jobs for Horticulture Technology is given below.

Suggested job descriptions and job tasks have been identified for each career opportunity. This information can be used to assist instructors in describing the types of educational experiences recommended for students. It is recommended that these statements be reviewed by local advisory committees and used to assist the institution in meeting local manpower needs.

Horticulture Technology Career Opportunities

(Validated by Survey)

Category	D.O.T. Number	Job Title
Entry Level	405.684-014	Garden Center Worker
	405.684-014	Greenhouse Worker
	406.684-014	Groundskeeper
	405.687-014	Landscape Construction Worker
	408.687-014	Landscape Worker
	408.684-010	Lawn-Service Worker
	405.687-014	Nursery Worker
	405.361-010	Plant Propagator
	272.357-022	Salesperson, Horticultural and Nursery Products
	408.684-018	Tree Pruner
Advanced Level	405.131-010	Greenhouse Superintendent
	405.161-014	Horticultural-Specialty Grower, Field
	405.161-018	Horticultural-Specialty Grower, Inside
	001.261-014	Landscape Drafter
	408.161-010	Landscape Gardener
	180.167-042	Nursery Manager

Garden Center Worker

ENTRY LEVEL

Job Description

Advises customer on selection of plants and methods of planting and cultivation. Suggests trees and shrubbery suitable for specified growing conditions. Water and trims growing plants on sales floor. Stores products in stockroom and assists in taking inventory. Recognizes diseased and damaged plants, and treats and removes plants not suitable for sale. Wraps merchandise for customer. Obtains merchandise from stockroom for customers.

Tasks

The following tasks may be performed:

Identify plants by common and scientific name (annuals, biennials, perennials, etc.).

Use resource material to identify unknown plants which cannot be identified by visual inspection.

Determine cultural requirements of plants (light, soil, moisture, temperature, etc.).

Describe to customers the purposes and qualities of merchandise for sale.

Use effective interpersonal relationships in dealing with customers.

Label and price mark merchandise.

Display store merchandise for sale.

Wrap and/or package merchandise sold.

Deliver or ship merchandise sold.

Rent equipment to customers.

Suggest to customer plant materials to be used under their situations.

Advise customers on fertilization, disease, and insect control on current information.

Water and properly care for plants on display and/or storage.

Repair or reball balled and burlapped plants.

Properly handle and load carts, trailers, trucks, or other vehicles for transportation of plants within the nursery and to delivery points.

Store received merchandise.

Greenhouse Worker

Job Description

Plants, cultivates, and harvests horticultural specialties, such as flowers and shrubs, and performs related duties in environmentally-controlled structure applying knowledge of environmental systems. Ascertains growing schedules and deviations from established procedures from grower or manager. Sows seed and plants cuttings. Looks at and feels leaf texture, bloom development, and soil condition to determine nutrient and moisture requirements and to detect and identify germ and pest infestations. Sets fertilizer timing and metering devices that control frequency and amount of nutrients to be introduced into irrigation system. Applies herbicides, fungicides, and pesticides to destroy undesirable growth and pests, using spray wand connected to solution tank. Reads and interprets sensing indicators and regulates humidity, ventilation, and carbon dioxide systems to control environmental conditions. Grafts scions to seedling stock. Pollinates, prunes, transplants, and pinches plants, and culls flowers, branches, fruit and plants to insure development of marketable products. Harvests, packs, and stores crop, using techniques appropriate for individual horticultural specialty. May maintain and repair environmental control systems. May maintain and repair structures, using materials, such as corrugated fiberglass panels, lath, glass panes, and putty, and tools, such as hammer, saw, and putty knife.

Tasks

The following tasks may be performed:

Identify plants by common and scientific name (annuals, biennials, perennials, etc.).

Use resource material to identify unknown plants which cannot be identified by visual inspection.

Determine cultural requirements of plants (light, soil, moisture, temperature, etc.).

Identify media materials.

Shred or screen different media materials.

Sterilize mixed soils.

Apply correct amendments to soil mix.

Fill benches, pots, and flats.

Sow seed in appropriate containers.

Make plant cuttings and put in appropriate containers and media.

Transplant seedlings to pots, flats, etc.

Label planted specimens.

Properly water greenhouse stock.

Prune and thin plants.

Fertilize plants.

Pinch potted plants.

Control temperature with fans and heaters.

Control humidity with ventilating fans and humidifiers.

Control the type and amount of light.

Force bulbs.

Force potted plants to bloom at seasonal times.

Identify and control weeds and chemicals, plastic, and mechanical means.

Fumigate greenhouse.

Identify, remove, and destroy diseased plants.

Control plant insects and diseases with chemicals.

Remove plants from bed to sell.

Select proper pot sizes for replanting plants.

Keep work, storage, delivery area, display area, nursery, greenhouse, salesroom, and other facilities neat and clean.

Clean and sharpen hand tools.

Tune up business vehicles, tractors, lifts, and other equipment as needed.

Repair display cases, storage shelves, slathouses, greenhouses, storage buildings, etc.

Maintain and repair small gas engines, dusters, sprayers, climbing equipment, etc.

Glaze windows.

Paint buildings, shelves, bins, etc.

Recover greenhouses.

Apply basic carpentry skills in building display beds, slathouses, storage sheds, greenhouses, and other construction projects.

Maintain and repair propagating structures and equipment.

Groundskeeper

Job Description

Maintains grounds of industrial, commercial, residential, or public property. Cuts lawns, using hand mower or power mower. Trims and edges around walks, flower beds, and walls, using clippers and edging tools. Prunes shrubs and trees to shape and improve growth, using shears. Sprays lawn, shrubs, and trees with fertilizer or insecticide. Rakes and burns leaves and cleans or sweeps up litter using spiked stick or broom. Plants grass, flowers, trees, and shrubs. Waters lawn and shrubs during dry periods, using hose or by activating fixed or portable sprinkler system. Cleans out drainage ditches and culverts, using shovel and rake. Depending on size and nature of employing establishment, uses tractor equipped with attachments, such as mowers, lime- or fertilizer-spreaders, and lawn roller.

Tasks

The following tasks may be performed:

Clean grounds of leaves and litter.

Identify weeds, pests, and diseases.

Determine methods of control needed to eradicate weeds, pests, and diseases.

Apply appropriate control measures and calibrate proper equipment.

Follow all safety precautions when administering control measures.

Discuss factors affecting control measures (wind, rain, temperature, etc.).

Clean drainage ditches, culverts, and gutters.

Prune and remove dead or unwanted plant branches.

Scrape plant wounds.

Apply protective substance to tree wounds or cut surfaces.

Prune and trim trees and shrubs at the correct time using proper equipment and methods.

Prepare lawn for reseeding.

Reseed, sod, or sprig a lawn.

Identify and remove poisonous plants.

Treat plant wounds and disease infestations.

Repair worn spots in lawn with sod or reseeding.

Apply lime and fertilizer according to soil test.

Water flower beds, lawns, trees, and shrubbery.

Mow and trim lawns.

Remove dead or unwanted trees or shrubs.

Cultivate flower beds.

Transplant trees and/or shrubs.

Select and use mulches.

Repair walkways, driveways, and patios.

Landscape Construction Worker

Job Description

Builds and repairs fences, gates, walls, walks, patios, and driveways using carpentry and masonry tools. Paints fences and buildings. Cleans out drainage ditches and culverts, using shovel and rake. Transports materials by truck and by wheelbarrow. Assists in keeping records of materials used and amount of time required to complete the job.

Tasks

The following tasks may be performed:

Clear brush and unwanted plants.

Fell and remove trees.

Clean drainage ditches, culverts, and gutters.

Repair walkways, driveways, and patios.

Apply basic carpentry skills in building display beds, slathouses, storage sheds, greenhouses, and other construction projects.

Install fences using different types of materials.

Install walls using railroad ties, block, brick, rock, or other materials.

Construct planters.

Construct garden bench seats.

Install walks and patios using brick, concrete, and other materials.

Erect suitable lighting for recreation and garden areas.

Install proper edging for various landscape areas.

Construct rock gardens and other specialized areas.

Landscape Worker

Job Description

Moves soil, equipment, and materials, digs holes, and performs related duties to assist LANDSCAPE GARDENER in landscaping grounds. Digs holes and trenches with pick and shovel. Plants and waters sod and shrubbery. Mixes and pours cement for garden borders and mows lawns. Places stone and plants flowers in garden areas. Hauls topsoil in wheelbarrow and spreads and levels soil, using rake.

Tasks

The following tasks may be performed:

Clear brush and unwanted plants.

Fell and remove trees.

Plow, disk, rake, till, or otherwise prepare land.

Prepare flower and shrub beds for planting.

Fumigate plant beds.

Apply proper amounts of lime and fertilizer based on soil test results.

Dig drainage ditches and install drain tile.

Dig holes for plant setting.

Apply pre-emergency chemicals for weed control.

Mix the soil and soil conditioners.

Relocate plants if needed.

Seed a lawn.

Place sod.

Sprig a lawn.

Place plants in beds, trenches, and holes.

Backfill the hole with soil mix.

Properly water the lawn, flowers, shrubs, and trees.

Mulch plantings with proper materials.

Untie and groom plants.

Support plants by guying, staking, or cabling.

Mow and trim lawns.

Lawn-Service Worker

Job Description

Cultivates lawns, using power aerator and thatcher and chemicals according to specifications. Lifts dead leaves and grass from between growing grass and soil, using thatcher. Pierces soil to make holes for fertilizer and water, using aerator. Presses aerator fork into soil and pulls rake through grass to cultivate areas not accessible to machines. Distributes granulated fertilizers, pesticides, and fungicides on lawns, using spreader. Records services rendered, materials used, and charges assessed on specified form. Transports thatcher, aerator, tools, and materials to and from job site, using truck with hydraulic lift-gate.

Tasks

Take soil sample and interpret results.

Plow, disk, rake, till, or otherwise prepare land.

Prepare flower and shrub beds for planting.

Fumigate plant beds.

Apply proper amounts of lime and fertilizer based on soil test results.

Apply pre-emergency chemicals for weed control.

Mix the soil and soil conditioners.

Seed a lawn.

Place sod.

Sprig a lawn.

Properly water the lawn, flowers, shrubs, and trees.

Mulch plantings with proper materials.

Clean grounds of leaves and litter.

Identify weeds, pests, and diseases.

Determine methods of control needed to eradicate weeds, pests, and diseases.

Apply appropriate control measures and calibrate proper equipment.

Follow all safety precautions when administering control measures.

Discuss factors affecting control measures (wind, rain, temperature, etc.).

Prune and remove dead or unwanted plant branches.

Scrape plant wounds.

Apply protective substance to tree wounds or cut surfaces.

Prepare lawn for reseeding.

Reseed, sod, or sprig a lawn.

Identify and remove poisonous plants.

Repair worn spots in lawn with sod or reseeding.

Water flower beds, lawns, trees, and shrubbery.

Mow and trim lawns.

Keep records of receipts and expenses.

Nursery Worker

Job Description

Performs any combination of following duties concerned with preparing soil and growth media, cultivating, and otherwise participating in horticultural activities under close supervision on acreage, in nursery, or in environmentally-controlled structures, such as greenhouse and shed: Hauls and spreads topsoil, fertilizer, peat moss, and other materials to condition land. Digs, rakes, and screens soil and fills cold frames and hot beds to prepare them for planting. Fills growing tanks with water. Plants, sprays, weeds, and waters plants, shrubs, and trees. Sows grass seed and plants plugs of sod and cuts, rolls, and stacks sod.

Tasks

The following tasks may be performed:

Identify plants by common and scientific name (annuals, biennials, perennials, etc.).

Use resource material to identify unknown plants which cannot be identified by visual inspection.

Determine cultural requirements of plants (light, soil, moisture, temperature, etc.).

Plow, disk, rake, till, or otherwise prepare land.

Prepare flower and shrub beds for planting.

Fumigate plant beds.

Apply proper amounts of lime and fertilizer based on soil test results.

Mix the soil and soil conditioners.

Seed a lawn.

Place sod.

Sprig a lawn.

Place plants in beds, trenches, and holes.

Backfill the hole with soil mix.

Properly water the lawn, flowers, shrubs, and trees.

Mulch plantings with proper materials.

Untie and groom plants.

Support plants by guying, staking, or cabling.

Prune and remove dead or unwanted plant branches.

Prepare lawn for reseeding.

Reseed, sod, or sprig a lawn.

Repair worn spots in lawn with sod or reseeding.

Identify media materials.

Shred or screen different media materials.

Sterilize mixed soils.

Apply correct amendments to soil mix.

Fill benches, pots, and flats.

Sow seed in appropriate containers.

Make plant cuttings and put in appropriate containers and media.

Transplant seedlings to pots, flats, etc.

Label planted specimens.

Properly water greenhouse stock.

Prune and thin plants.

Fertilize plants.

Pinch potted plants.

Remove plants from bed to sell.

Select proper pot sizes for replanting plants.

Plow, disk, level, and lay off rows for planting.

Properly plant various species of plants.

Cultivate plants.

Properly fertilize plants.

Prune plants at proper time using appropriate methods.

Dig plants properly (machine or by hand).

Select proper media and prepare media according to soil tests.

Select proper sized containers.

Sterilize media.

Pot and repot plants properly.

Prepare the beds including drainage system.

Space containers properly in beds.

Mulch plants properly for winter protection.

Prune plants at proper time using appropriate methods.

Keep work, storage, delivery area, display area, nursery, greenhouse, salesroom, and other facilities neat and clean.

Plant Propagator

Job Description

Propagates plants applying knowledge of environmental controls and plant culture. Confers with management personnel to ascertain type and number of species to propagate and to develop and revise nutrient formulas and environmental-control specifications. Selects materials according to kind of plant; mixes growth media; and prepares containers, such as jars, pots, and trays. Initiates new plant growth using methods, such as the following: (1) Cuts leaves, stems, or rhizomes from parent plant and places cuttings in growth media. (2) Bends, covers, or buries branches of parent plant in soil, using sharp knife, inserts pebble into wound, and binds wound with moss, burlap or raffia. (4) Plants meristem and seeds in growth media. (5) Breaks off or cuts apart and plants roots, crowns and tubers from parent plant. Inspects growing area to ascertain temperature and humidity conditions, and regulates systems of heaters, fans, and sprayers to insure conformance with specifications. Gives transplanting and cultivation instructions to co-workers, and monitors activities to assure adherence to established plant-culture procedures. May graft or divide developing plants to promote altered growth characteristics. May log activities, maintain propagation records, and compile periodic reports.

Tasks

The following tasks may be performed:

Identify plants by common and scientific name (annuals, biennials, perennials, etc.).

Use resource material to identify unknown plants which cannot be identified by visual inspection.

Select proper propagating stock.

Propagate different types of plants at the correct time using proper techniques and procedures.

Properly identify and utilize propagating structures and equipment.

Develop propagating systems to meet specific situations.

Identify media materials.

Shred or screen different media materials.

Determine soil mix for specific plant requirements.

Sterilize mixed soils.

Apply correct amendments to soil mix.

Fill benches, pots, and flats.

Make propagation and seed sowing schedules.

Sow seed in appropriate containers.

Make plant cuttings and put in appropriate containers and media.

Transplant seedlings to pots, flats, etc.

Label planted specimens.

Control temperature with fans and heaters.

Control humidity with ventilating fans and humidifiers.

Control the type and amount of light.

Force bulbs.

Force potted plants to bloom at seasonal times

Salesperson, Horticultural and Nursery Products

Job Description

Sells container-grown plants and garden supplies in nursery, greenhouse, or department store. Advises customer on selection of plants and methods of planting and cultivation. Suggests trees and shrubbery suitable for specified growing conditions. Greets customer on sales floor and ascertains make, type, and quality of merchandise desired. Displays merchandise, suggests selections that meet customer's needs, and emphasizes selling points of article, such as quality and utility. Prepares sales slip or sales contract. Receives payment or obtains credit authorization. Places new merchandise on display. May wrap merchandise for customer. May take inventory of stock. May requisition merchandise from stockroom. May visit customer's home by appointment to sell merchandise on shop-at-home basis.

Tasks

The following tasks may be performed:

Identify plants by common and scientific name (annuals, biennials, perennials, etc.).

Use resource material to identify unknown plants which cannot be identified by visual inspection.

Determine cultural requirements of plants (light, soil, moisture, temperature, etc.).

Identify customer needs and wants.

Describe to customers the purposes and qualities of merchandise for sale.

Take orders for sales or service by telephone.

Quote cost of plants.

Make cost estimates on customer orders.

Use effective interpersonal relationships in dealing with customers.

Label and price mark merchandise.

Display store merchandise for sale.

Wrap and/or package merchandise sold.

Deliver or ship merchandise sold.

Rent equipment to customers.

Suggest to customer plant materials to be used under their situations.

Use cash register, adding machine, calculator, and other recording devices.

Advise customers on fertilization, disease, and insect control on current information.

Answer customer complaints.

Write up customer orders.

Tree Pruner

Job Description

Cuts away dead and excess branches from fruit, nuts, and shade trees, using handsaws, pruning hooks and shears, and long-handled clippers. Applies tar or other protective substances to cut surfaces to seal surfaces against insects. May use truck-mounted hydraulic lifts and pruners and power pruners. May climb trees, using climbing hooks and belts, or climb ladders to gain access to work area.

Tasks

The following tasks may be performed:

Prune and remove dead or unwanted plant branches.

Scrape plant wounds.

Apply protective substance to tree wounds or cut surfaces.

Prune and trim trees and shrubs at the correct time using proper equipment and methods.

Greenhouse Superintendent

ADVANCED LEVEL

Job Description

Supervises and coordinates activities of workers engaged in propagating, cultivating, and harvesting horticultural specialties, such as shrubs, flowering plants, and flowers, applying knowledge of environmental-control structures, systems, and techniques and plant culture. Discusses plant growing activities with management personnel to plan schedules and employee assignments; obtain authorization for changes in fertilizer, herbicide, and pesticide application techniques and formulas, resolve problems, and develop procedures for new species in product line and new cultivation techniques. Observes plants and flowers in greenhouses, pots, and cold frames to ascertain condition, such as leaf texture and bloom size; and oversees changes in humidity and temperature levels and cultivation procedures to insure conformance with quality-control standards. Prepares and assigns work schedules. Trains new employees in gardening techniques, such as transplanting and weeding, and grading and packaging activities. Inspects facilities for signs of disrepair, such as missing glass-panes and clogged sprinklers, and delegates repair duties to insure refurbishing or replacement of parts in environmental-control structures and systems. May drive and operate heavy machinery, such as dump truck, four-wheeled tractor, and growth-media tiller, to handle materials and supplies. May perform variety of duties involving propagation, care, and marketing of plants and crops.

Tasks

The following tasks may be performed in addition to those performed by the Greenhouse Worker:

Determine soil mix for specific plant requirements.

Make propagation and seed sowing schedules.

Develop light maintenance schedule for business vehicles, tractors, lifts, and other equipment (oil, lubrication, tire pressure, battery, brake fluid, radiator, etc.).

Operate efficiently all equipment used in the nursery (tractors, tractor implements, planting augers, plant diggers, trenchers, front-end loaders, trucks, soil mixers, potting machines, etc.).

Follow safety precautions for all equpment.

Determine appropriate equipment to use for various jobs.

Make minor changes to agricultural and industrial equipment to adopt it to the nursery operation.

Take periodic inventory.

Keep records of receipts and expenses.

Prepare and mail bills to collect accounts due.

Keep employee work records.

Prepare employee payroll.

Assist in records audit.

Prepare income tax and other necessary reports.

Keep annual depreciation schedule.

File records and other materials.

Develop adequate record system for ordering and restocking plants and materials, pricing, determining quantities for production, and for profit analysis.

Keep maintenance and repair records on equipment.

Keep current inventory of merchandise for sale.

Check received merchandise against invoice listings.

Check invoices for errors.

Store received merchandise.

Order replacement and/or new merchandise.

Arrange for transportation of materials purchased.

Order repair parts for business vehicles and equipment.

Identify labor needs.

Determine kinds and amount of equipment to buy and stock.

Identify and select producers and suppliers of plants, equipment, supplies, etc.

Select and purchase equipment, supplies, etc.

Enforce safety regulations.

Recruit and select employees.

Train employees.

Designate employee work assignments.

Supervise employees.

Evaluate employee performance.

Perform personnel actions such as promoting, firing, disciplinary action, etc.

Establish employee wages, hours, and working conditions.

Identify and utilize business laws, tax laws, and laws pertaining to hiring, paying, and treating employees.

Analyze new products and plants to determine if they need to be added to the sales line.

Analyze current market trends and expansion possibilities.

Identify various professional and trade associations and make decision about membership in these organizations.

Identify and locate current information on plant diseases, pesticides, new plants and varieties, insects, equipment, etc.

Identify and subscribe to various professional and trade publications.

Horticultural-Specialty Grower, Field

Job Description

Propagates and grows horticultural crops such as seeds, bulbs, rootstocks, and ornamental plants. Plans acreage utilization and work schedules according to knowledge of crop culture, climate, and market conditions, seed, bulb, or rootstock availability, and employable workforce and machinery. Attaches farm implements, such as disc and fertilizer spreader, to tractor and drives tractor in fields to till soil and plant and cultivate crop. Inspects fields periodically to ascertain nutrient deficients, detect insect, disease, and pest infestations, and identify foreign plant growth, and selects, purchases, and schedules materials, such as fertilizers and herbicides, to insure quality control. Hires workers, assigns their duties, according to scheduled activities, such as planting, irrigating, weeding, and harvesting, and oversees their activities. Maintains personnel and production records. May drive and operate harvesting machines. May lubricate, adjust, and make minor repairs on farm machinery and equipment. Arranges with customers for sale of crop.

Tasks

The following tasks may be performed:

Identify plants by common and scientific name (annuals, biennials, perennials, etc.).

Use resource material to identify unknown plants which cannot be identified by visual inspection.

Determine cultural requirements of plants (light, soil, moisture, temperature, etc.).

Take soil sample and interpret data.

Calibrate spreader and apply fertilizer and lime according to soil test data.

Plow, disk, level, and lay off rows for planting.

Lay off and install drainage system if needed.

Install and operate irrigation system.

Properly plant various species of plants.

Cultivate plants.

Develop fertilization program for maintaining plants.

Properly fertilize plants.

Prune plants at proper time using appropriate methods.

Identify weeds, pests, and diseases.

Remove dead or undesirable stock.

Determine methods of control needed to eradicate weeds, pests, and diseases.

Apply appropriate control measures.

Discuss factors affecting control measures (wind, rain, temperature, etc.).

Follow all safety factors when administering control measures.

Dig plants properly (machine or by hand).

Select proper media and prepare media according to soil tests.

Select proper sized containers.

Sterilize media.

Pot and repot plants properly.

Prepare the beds including drainage system.

Space containers properly in beds.

Set up and maintain irrigation system.

Operate irrigation system.

Mulch plants properly for winter protection.

Prune plants at proper time using appropriate methods.

Identify weeds, pests, and diseases.

Remove dead or undesirable stock.

Determine methods of control needed to eradicate weeds, pests, and diseases.

Apply appropriate control measures.

Follow all safety factors when administering control measures.

Develop light maintenance schedule for business vehicles, tractors, lifts, and other equipment (oil, lubrication, tire pressure, battery, brake fluid, radiator, etc.).

Tune up business vehicles, tractors, lifts, and other equipment as needed.

Maintain and repair small gas engines, dusters, sprayers, climbing equipment, etc.

Operate efficiently all equipment used in the nursery (tractors, tractor implements, planting augers, plant diggers, trenchers, front-end loaders, trucks, soil mixers, potting machines, etc.).

Follow safety precautions for all equipment.

Determine appropriate equipment to use for various jobs.

Make minor changes to agricultural and industrial equipment to adopt it to the nursery operation.

Horticultural-Specialty Grower, Inside

Job Description

Grows horticultural-specialty products and crops, such as flowers, ornamental plants, and vegetables, under environmentally-controlled conditions, applying knowledge of plant culture, environmental-control systems and structures, and market conditions. Determines types and quantities of plantings to grow; allocates space in structure, such as greenhouse or shed; and schedules growing activities. Plants seeds and transplants seedlings in material, such as bark, gravel, sandy soil, and stable straw to propagate seeds and nursery stock. Removes substandard plants to maintain quality control, prunes plants to enhance development, and positions plants to artistically display products. Monitor timing and metering devices that control frequency, amount, and type of nutrient applications; regulate humidity, ventilation, and carbon dioxide conditions; and dispense herbicides, fungicides, subordinates. May assign their duties. May hire workers. May maintain personnel and production records. May deal with vendors to purchase supplies and materials, and arrange with customers to sell products and crops.

Tasks

The following tasks may be performed:

Identify plants by common and scientific name (annuals, biennials, perennials, etc.).

Use resource material to identify unknown plants which cannot be identified by visual inspection.

Determine cultural requirements of plants (light, soil, moisture, temperature, etc.).

Select proper propagating stock.

Propagate different types of plants at the correct time using proper techniques and procedures.

Properly identify and utilize propagating structures and equipment.

Develop propagating systems to meet specific situations.

Maintain and repair propagating structures and equipment.

Identify media materials.

Shred or screen different media materials.

Determine soil mix for specific plant requirements.

Sterilize mixed soils.

Apply correct amendments to soil mix.

Fill benches, pots, and flats.

Make propagation and seed sowing schedules.

Sow seed in appropriate containers.

Make plant cuttings and put in appropriate containers and media.

Transplant seedlings to pots, flats, etc.

Label planted specimens.

Properly water greenhouse stock.

Prune and thin plants.

Fertilize plants.

Pinch potted plants.

Control temperature with fans and heaters.

Control humidity with ventilating fans and humidifiers.

Control the type and amount of light.

Force bulbs.

Force potted plants to bloom at seasonal times.

Identify and control weeds and chemicals, plastic, and mechanical means.

Fumigate greenhouse.

Identify, remove, and destroy diseased plants.

Control plant insects and diseases with chemicals.

Remove plants from bed to sell.

Select proper pot sizes for replanting plants.

Landscape Drafter

Job Description

Prepares detailed scale drawings and tracings from rough sketches or other data provided by LANDSCAPE ARCHITECT. Makes final sketch of proposed drawing, checking dimension of parts, materials to be used, relation of one part to another, and relation of various parts to whole structure or project. Makes any adjustments or changes necessary or desired. Inks in lines and letters on pencil drawings as required. Exercises manual skill in manipulation of triangle, T-square, and other drafting tools. May prepare separate detailed site plan, grading and drainage plan, lighting plan, paving plan, irrigation plan, planting plan, and drawings and detail of garden structures. May build models of proposed landscape construction and prepare colored drawings for presentation to client.

Tasks

The following tasks may be performed:

Identify plants by common and scientific name (annuals, biennials, perennials, etc.).

Use resource material to identify unknown plants which cannot be identified by visual inspection.

Determine cultural requirements of plants (light, soil, moisture, temperature, etc.).

Identify and use drafting equipment.

Develop knowledge of landscape symbols.

Key and letter a drawing.

Consult with client to determine his needs and wishes.

Survey the landscape area.

Locate existing water and sewer lines in landscape areas.

Develop landscape design by using principles and techniques that fit the job.

Select appropriate plant materials for the design.

Select proper planting site for different types of plants

Lay out space requirements.

Estimate labor in terms of numbers of men and hours.

Prepare cost estimate of plan.

Read and interpret landscape plans drawn by designers and architects.

Landscape Gardener

Job Description

Plans and executes small scale landscaping operations and maintains grounds and landscape of private and business residences. Participates with LANDSCAPE WORKER in preparing and grading terrain, applying fertilizers, seeding and sodding lawns, and transplanting shrubs and plants, using manual and power-operated equipment. Plans lawns, plants and cultivates them, using gardening implements and power-operated equipment. Plants new and repairs established lawns, using seed mixtures and fertilizers recommended for particular soil type and lawn location. Locates and plants shrubs, trees, and flowers selected by property owner or those recommended for particular landscape effect. Mows and trims lawns, using hand mower or power mower. Trims shrubs and cultivates gardens. Cleans grounds, using rakes, brooms, and hose. Sprays trees and shrubs and applies supplemental liquid and dry nutrients to lawn and trees. May dig trenches and install drain tiles. May make repairs to concrete and asphalt walks and driveways.

Tasks

The following tasks may be performed in addition to those performed by the Landscape Worker:

Identify plants by common and scientific name (annuals, biennials, perennials, etc.).

Use resource material to identify unknown plants which cannot be identified by visual inspection.

Determine cultural requirements of plants (light, soil, moisture, temperature, etc.).

Determine time of year to plant various species.

Select proper planting site for different types of plants.

Take soil sample and interpret results.

Install irrigation system if needed.

Clean up and make final inspection of landscape job.

Identify weeds, pests, and diseases.

Determine methods of control needed to eradicate weeds, pests, and diseases.

Apply appropriate control measures and calibrate proper equipment.

Follow all safety precautions when administering control measures.

Discuss factors affecting control measures (wind, rain, temperature, etc.).

Prune and remove dead or unwanted plant branches.

Scrape plant wounds.

Apply protective substance to tree wounds or cut surfaces.

Prune and trim trees and shrubs at the correct time using proper equipment and methods.

Install fences using different types of materials.

Install walls using railroad ties, block, brick, rock, or other materials.

Construct planters.

Construct garden bench seats.

Install walks and patios using brick, concrete, and other materials.

Erect suitable lighting for recreation and garden areas.

Install proper edging for various landscape areas.

Construct rock gardens and other specialized areas.

Nursery Manager

Job Description

Manages nursery to grow horticultural plants, such as trees, shrubs, flowers, ornamental plants, or vegetables for sale to trade or retail customers. Determines types and quantity of horticultural plants to be grown, considering such factors as whether plants will be grown under controlled conditions in hothouse or greenhouse or under natural weather conditions in field, and market demand or conditions, utilizing knowledge of plant germination, growing habits plants, soil conditioners, plant nutrients, and disease control requirements. Selects and purchases seed, plant nutrients, and disease control chemicals according to type of horticultural plants and conditions under which plants will be grown. Directs and coordinates, through subordinate supervisor personnel, activities of workers engaged in planting of seed, raising, feeding, and controlling growth and disease of plants, and transplanting, potting, or cutting plants for marketing. Coordinates clerical, recordkeeping, accounting, and marketing activities. May purchase nursery stock for resale and sell gardening accessories, such as sprays, garden implements, and plant nutrients.

Tasks

The following tasks may be performed in addition to those performed by the Nursery Worker:

Determine soil mix for specific plant requirements.

Make propagation and seed sowing schedules.

Control temperature with fans and heaters.

Control humidity with ventilating fans and humidifiers.

Control the type and amount of light.

Force bulbs.

Force potted plants to bloom at seasonal times.

Identify weeds and control them by chemicals, plastic, and mechanical means.

Fumigate greenhouse.

Identify, remove, and destroy diseased plants.

Identify and subscribe to various professional trade publications.

Control plant insects and diseases with chemicals.

Take soil sample and interpret data.

Calibrate spreader and apply fertilizer and lime according to soil test data.

Lay off and install drainage system if needed.

Install and operate irrigation system.

Develop fertilization program for maintaining plants.

Identify weeds, pests, and diseases.

Remove dead or undesirable stock.

Determine methods of control needed to eradicate weeds, pests, and diseases.

Apply appropriate control measures.

Discuss factors affecting control measures (wind, rain, temperature, etc.).

Follow all safety factors when administering control measures.

Operate efficiently all equipment used in the nursery (tractors, tractor implements, planting augers, plant diggers, trenchers, front-end loaders, trucks, soil mixers, potting machines, etc.).

Follow safety precautions for all equipment.

Determine appropriate equipment to use for various jobs.

Make minor changes to agricultural and industrial equipment to adopt it to the nursery operation.

Make minor equipment repairs.

Take periodic inventory.

Keep records of receipts and expenses.

Prepare and mail bills to collect accounts due.

Keep employee work records.

Prepare employee payroll.

Assist in records audit.

Prepare income tax and other necessary reports.

Keep annual depreciation schedule.

Develop customer credit records.

File records and other materials.

Develop adequate record system for ordering and restocking plants and materials, pricing, determining quantities for production, and for profit analysis.

Keep maintenance and repair records on equipment.

Keep current inventory of merchandise for sale.

Check received merchandise against invoice listings.

Check invoices for errors.

Store received merchandise.

Order replacement and/or new merchandise.

Arrange for transportation of materials purchased.

Order repair parts for business vehicles and equipment.

Identify labor needs.

Determine kinds and amount of equipment to buy and stock.

Identify and select producers and suppliers of plants, equipment, supplies, etc.

Select and purchase equipment, supplies, etc.

Enforce safety regulations.

Recruit and select employees.

Train employees.

Designate employee work assignments.

Supervise employees.

Evaluate employee performance.

Perform personnel actions such as promoting, firing, disciplinary action, etc.

Establish employee wages, hours, and working conditions.

Administer social security and other employee benefit programs.

Identify and utilize business laws, tax laws, and laws pertaining to hiring, paying, and treating employees.

Analyze new products and plants to determine if they need to be added to the sales line.

Analyze current market trends and expansion possibilities.

Determine need for, select reputable insurer, and purchase comprehensive business insurance.

Estimate costs of projects and make proper bids.

Carry out or implement landscape design plans.

Determine appropriate plant replacements if specified plants are not available in landscape plan.

Determine business credit needs.

Locate sources of and secure credit.

Prepare, negotiate, and implement sales contracts.

Allocate monies in preparing budget.

Analyse business enterprises on cost and return basis.

Arrange trade-ins and credit terms.

Check credit references of customers.

Advertise products effectively through newspapers, magazines, sales leaflets, radio, television, store displays, special displays, etc.

Use supplier advertising materials effectively.

Identify customer needs and wants.

Follow up sales to determine customer satisfaction.

Prepare and keep current price lists and sales catalogs.

Develop and verify customer directories.

Identify various professional and trade associations and make decision about membership in these organizations.

Be aware of how and where to find current information on plant diseases, pesticides, new plants and varieties, insects, equipment, etc.

CHAPTER III

THE CURRICULUM AND INSTRUCTIONAL FACTORS

The suggested Horticulture Technology curriculum, course descriptions, and course outlines were developed by the curriculum committee to assist institutions in revising their existing curriculum or in implementing the Horticulture Technology curriculum as a new program. The materials were developed with input from horticulture employers, employees, and instructors from across the state. It reflects current needs as perceived by these individuals.

The information contained in the sections on Faculty and Staff Selection and Certification, Facilities, Equipment, and Instructional Aids, the Library, and Professional Boards and Associations is designed to assist institutional personnel in planning and developing a quality Horticulture Technology program and improving instructional effectiveness.

Complete course outlines are provided in the last section of this Chapter for all courses except the English, Business Math, and Chemistry. Brief topical outlines are provided for these courses. To obtain copies of complete course outlines for the English, Business Math, and Chemistry courses, contact the Program Development Division, Department of Community Colleges, Education Building, Raleigh, NC 27611 and request the course outline by title and number.

AGRICULTURAL AND NATURAL RESOURCES EDUCATION

HORTICULTURE TECHNOLOGY

INTRODUCTION

Purpose of Curriculum

The Horticulture Technology curriculum encompasses the study and practical application of many varied subjects in the field of horticulture. The curriculum consists of identifying and selecting plant materials; propagating, planting, and growing plants; designing basic landscapes and planting materials at the appropriate places and in the correct manner; properly maintaining plant materials; and managing the nursery, greenhouse and garden center. In addition, skills are developed in designing and building planters, walks, patios, fences, and other landscape features. The curriculum is designed to provide students with the knowledge, skills, and attitudes that are necessary for independent, creative thinking essential to success in this field.

Employment Opportunities

Numerous employment opportunities are available to the graduate of the Horticulture Technology curriculum. Some of the specific job titles include landscape gardener, groundskeeper, nursery, and garden center worker, salesperson--garden and horticulture equipment and supplies, nursery and/or greenhouse supervisor, propagator and landscape construction worker.

Various types of employers hire the graduates of this curriculum. Examples are nurseries, greenhouse operations, garden centers, landscape contractors, landscape maintenance companies and municipal governmental agencies. The employee is usually required to carry out various responsibilities, depending upon the needs of the employer.

AGRICULTURE AND NATURAL RESOURCES EDUCATION

HORTICULTURE TECHNOLOGY

SUGGESTED CURRICULUM BY QUARTERS

			Hours Per Week			Quarter Hours
		Course Title	Class	Lab.	Clin.	Credit
FIRST QUARTER						
HOR	135	Landscape Drafting	2	4	0	4
AGR	170	Plant Science	5	2	0	6
BUS	109	Business Mathematics	5	0	0	5
ENG	101	Grammar	3	0	0	3
			15	6	0	18
SECOND QUARTER						
HOR	144	Plant Propagation	3	2	0	4
HOR	147	Indoor Plants	2	4	0	4
AGR	201	Agricultural Chemicals	3	2	0	4
CHM	101	Chemistry	4	2	0	5
ENG	102	Composition	3	0	0	3
			15	10	0	20
THIRD QUARTER						
HOR	148	Plant Insects and Diseases	5	2	0	6
HOR	151	Plant Materials I	2	4	0	4
AGR	185	Soil Science & Fertilizers	5	2	0	6
ENG	103	Report Writing	3	0	0	3
			15	8	0	19
FOURTH QUARTER						
HOR	152	Plant Materials II	2	4	0	4
HOR	224	Landscape Maintenance	2	4	0	4
HOR	251	Landscape Planning I	2	4	0	4
HOR	259	Garden Center Operation	2	2	0	3
ENG	204	Oral Communication	3	0	0	3
			11	14	0	18

		Course Title	Hours Per Week Class	 Lab.	 Clin.	Quarter Hours Credit
FIFTH QUARTER						
HOR	256	Nursery Management I	2	4	0	4
HOR	258	Turf Grass Management	2	4	0	4
HOR	260	Landscape Construction	2	4	0	4
BUS	195	Small Business Operations	3	0	0	3
		Social Science Elective	3	0	0	3
			12	12	0	18
SIXTH QUARTER						
HOR	252	Landscape Planning II	2	4	0	4
HOR	257	Nursery Management II	2	4	0	4
HOR	264	Greenhouse Management	2	4	0	4
		Social Science Elective	3	0	0	3
		Elective	3	0	0	3
			12	12	0	18
SEVENTH QUARTER						
HOR	199	Cooperative Work Experience	0	0	40	4
			0	0	40	4

Total Quarter Hours in Required Courses	108
Electives	3
Total	111
Cooperative Work Experience	4
TOTAL	115

AGRICULTURAL AND NATURAL RESOURCES EDUCATION

HORTICULTURE TECHNOLOGY

COURSE DESCRIPTIONS BY QUARTERS

	Hours Per Week			Quarter Hours Credit
	Class	Lab.	Clin.	
FIRST QUARTER				
HOR 135 Landscape Drafting	2	4	0	4

A course designed to provide fundamental knowledge of the principles of drafting. Basic skills and techniques of drafting include the proper use and care of drafting equipment and supplies, lettering, sketching, line technique, geometric construction, instrument drawings of principle orthographic views and dimension lines and numbers. Landscape symbols will also be studied.
Prerequisite: None.

AGR 170 Plant Science	5	2	0	6

An introductory general botany and plant science course covering the fundamental principles of the reproduction, growth, functions and development of seed bearing plants.
Prerequisite: None.

BUS 109 Business Mathematics	5	0	0	5

This course was designed to provide a review of the fundamentals of arithmetic and their practical application to business problems in the processes of trading, operating, ownership, financing, investing, summarizing, and analyzing. Topics covered include cash and trade discounts, markup, interest, taxes, and pertinent uses of mathematics in business and industry.
Prerequisite: None.

ENG 101 Grammar	3	0	0	3

Designed to aid the student in the improvement of self-expression through writing. Emphasis is on grammar, diction, sentence structure, punctuation, and spelling. It is intended to stimulate students in applying the basic principles of English grammar in their day-to-day situations in industry and social life.
Prerequisite: None.

SECOND QUARTER

HOR 144 Plant Propagation 3 4 0 4

A study of basic concepts and principles of sexual and asexual propagation. Techniques are learned through practical exercises conducted in laboratory sessions. Emphasis is given to those propagation methods widely utilized in the horticulture industry.
Prerequisite: None.

HOR 147 Indoor Plants 2 4 0 4

A study of the identification, selection, cultural requirements, and maintenance of plants used for indoor settings, residences, shopping centers, commercial buildings and other dwellings. Emphasis is also placed on interiorscape plans.
Prerequisite: HOR 135.

AGR 201 Agricultural Chemicals 3 2 0 4

A study of agricultural chemicals--their importance, ingredients, formulation, laws, and application with emphasis upon the effective and safe utilization of chemicals in agricultural pest control. Particular emphasis is placed upon weed identification and the chemicals utilized for weed control.
Prerequisite: None.

CHM 101 Chemistry 4 2 0 5

Study of the physical and chemical properties of substances, chemical changes; elements, compounds, gases, chemical combinations; weights and measurements; theory of metals; acids, bases, salts, solvents, solutions, and emulsions. In addition, study of carbohydrates; electrochemistry, electrolytes, and electrolysis in their application of chemistry to industry.
Prerequisite: BUS 109.

ENG 102 Composition 3 0 0 3

English composition is designed to aid the student in improvement of self-expression by means of practical application in business and technical writing. Emphasis is on writing sentences, paragraphs, and composition.
Prerequisite: ENG 101.

THIRD QUARTER

HOR 148 Plant Insects and Diseases 5 2 0 6

A study of the detection, identification, and control of insects and diseases that attack plant materials. The nature, structure, and importance of insects is studied. In addition, the structure and life history of various disease organisms are included.
Prerequisite: AGR 201.

HOR 151 Plant Materials I 2 4 0 4

This course provides an introduction to the study of ornamental shrubs, annual, biennial and perennial plants, groundcovers, and vines that are used for landscape purposes. Students are required to identify each plant by its common and scientific name describe to major uses in the landscape, and provide information on its cultural requirements.
Prerequisite: None.

AGR 185 Soil Science and Fertilizers 5 2 0 6

A course dealing with the basic principles of efficient classification, evaluation, and management of soils; care, cultivation and fertilization of the soil, and conservation of soil fertility.
Prerequisite: None.

ENG 103 Report Writing 3 0 0 3

The fundamentals of English are utilized as a background for the organization and techniques of report writing. Exercises in developing typical reports, using writing techniques and graphic devices are completed by the students. Practical application in the preparation of a full-length report is required of each student at the end of the term. The report must relate to the student's specific curriculum.
Prerequisite: ENG 102.

FOURTH QUARTER

HOR 152 Plant Materials II 2 4 0 4

A study of selected evergreen and deciduous trees including large shrubs which are often considered small trees that are designed for landscape purposes. Identification, cultural requirements, and uses of selected trees and large shrubs will be covered.
Prerequisite: HOR 151.

HOR 224 Landscape Maintenance 2 4 0 4

The principles and techniques of maintaining lawns, shrubs, trees, flowers, bulbs, and other plantings. Included is fertilization, disease control, pruning, irrigation, and proper use of various herbicides and pesticides.
Prerequisites: AGR 185, AGR 201, HOR 151.

HOR 251 Landscape Planning I 2 4 0 4

An introduction to blueprint reading and an introductory study of the basic principles of landscape design. The course is oriented toward an understanding of basic principles fundamental to all landscape design endeavors. However, emphasis is placed upon students developing residential site plans.
Prerequisite: HOR 135.

HOR 259 Garden Center Operation 2 2 0 3

A course covering all phases of garden center operation including some of the major problems. Areas of study in this course include layout, stocking, product knowledge, traffic flow, seasonal fluctuations, risks, diversification, and merchandising. Ample time will be devoted to visitations to established garden center operations.
Prerequisite: BUS 109.

ENG 204 Oral Communication 3 0 0 3

The principles, techniques, and practical applications of communicating the thoughts and personality through the voice and visible action of the individual to one or more persons for the purpose of achieving a previously determined response. Areas covered vary according to class needs, but in general, include: basic concepts, nonverbal and verbal language, vocal usage, speech preparation (analyzing audience and occasion, determining purpose, selecting and narrowing subject, gathering and organizing material, wording and practicing aloud), and effective listening.
Prerequisite: None.

FIFTH QUARTER

HOR 256 Nursery Management I 2 4 0 4

The production of field grown nursery stock is emphasized in this course. In addition, management practices and techniques including areas such as cost finding, price establishing, recordkeeping, planning of nursery layout of facilities, and personnel management are included.
Prerequisite: HOR 144, HOR 148, AGR 185, AGR 201.

HOR 258 Turf Grass Management 2 4 0 4

Identification and use of the various turf grasses used in residential and commercial lawns with an explanation of the principles of turf grass management. The course includes actual field problems in preparing the soil, seeding, sprigging, laying sod and irrigation of turf grasses. Operation and maintenance of turf equipment will also be emphasized.
Prerequisites: AGR 185, AGR 201, HOR 148.

HOR 260 Landscape Construction 2 4 0 4

This course is designed to teach the student how to plan the total landscape environment. Emphasis will be placed on the construction of and proper placement of masonry walls, rock walls, patios, walks, etc., blending them in with appropriate plant materials.
Prerequisite: HOR 251.

BUS 195 Small Business Operations 3 0 0 3

An introduction to the business world, problems of small business operation, basic business law, business forms and records, financial problems, ordering and inventorying, layout of equipment and offices, methods of improving business, and employer-employee relations.
Prerequisite: None.

SIXTH QUARTER

HOR 252 Landscape Planning II 2 4 0 4

A continuation of HOR 251 with increased emphasis on the planning, development, and design of residential and commercial landscape areas. An introduction to elementary surveying will be included. In addition, fundamentals of landscape economics such as costs, contracts, calculating areas, volumes, and plant quantities for landscape projects will be covered.
Prerequisites: HOR 135, HOR 251.

HOR 257 Nursery Management II 2 4 0 4

A study of container grown nursery operations to acquaint the student with the diversity of nursery plant production, equipment and operation detail. Areas of instruction include determination of plants to be grown, soil requirements, facilities, propagation, fertilization, pruning, disease and pest control, irrigation, selling and energy saving practices.
Prerequisite: HOR 256.

HOR 264 Greenhouse Management 2 4 0 4

A study of the fundamentals and practices in greenhouse plant production, including the control of heat, light, ventilation, and humidity. Construction and management of plastic, glass, and fiberglass greenhouses is studied. Crop studies include both cut flower and pot plant crops.
Prerequisites: AGR 201, HOR 144, HOR 148.

SEVENTH QUARTER

HOR 199 Cooperative Work Experience 0 0 40 4

The objective of this course is to provide the student with work experience like that of employment. This period of time will enable the student to use the equipment and perform the processes and services required of the specialty. This experience will be carefully planned and closely supervised by both the educational institution and the agency or business where the student is employed. An official agreement among the educational institution, the student, and the agency or business will provide for a programmed sequence of activities to be performed by the student with supervisory responsibilities for the educational elements of the work clearly defined.
Prerequisite: A minimum of two quarters of class and laboratory work.

ELECTIVES

An appropriate list of electives for Horticulture Technology is given below. Institutions may select from these elective courses to complete the program of study or an institution has the prerogative to develop new courses for the electives or modify courses from the suggested list to fulfill local objectives. It is suggested, however, that technical courses be appropriate to the major area of study; that they not change or alter the major objectives of the program or create a false impression of proficiency in an area either related or foreign to the major.

Elective courses must be selected from an associate degree course or new courses should be developed at a comparable level. The institution may elect to require certain courses or may let the student select an appropriate course.

Horticulture

HOR 201 Property Law and Basic Surveying 3 2 0 4

The study of federal, state and county and municipal laws and regulations affecting the ownership and management of public, corporate, and private lands, especially pertaining to the growth and maintenance of trees and ornamental plants. The mechanics and legalities of property line location, including fundamental surveying techniques, will be studied.

HOR 250 Fruit and Vegetable Production 3 2 0 4

A study of the importance and principles of production and marketing of the major vegetable crops. Identification and methods of production and marketing of the principle trees and small fruits.

HOR 253 Arboriculture 2 4 0 4

Arboriculture involves the principles and practices of selection, use, establishment, and care of shade and ornamental trees. Practical applications in the course include climbing, pruning, bracing, and other physical operations required of skilled tree workers.

HOR 255 Tree Surgery and Removal 2 3 0 3

The techniques and mechanics of tree topping, limbing, pruning, felling, and removal will be taught, including the selection, use, and maintenance of necessary equipment. Major stress will be placed on safety. Students will receive practical experience and instruction in the use of such necessary equipment as chain saws, pruning and trimming devices, climbing equipment, brush clippers, boom trucks, and other related machinery.

HOR 266 Tree Pruning and Repair 3 2 0 4

A basic course in pruning and tree repair principles and techniques. Special emphasis is given to pruning and repair of apple trees. Climbing and ladder work are included as laboratory experience.

Business

BUS 102 Typewriting 2 3 0 3

The student will be introduced to the touch typewriting system and will learn to use proper typing techniques, master the keyboard, type personal letters and postal cards and be able to tabulate. Upon completion of the course the student will be able to type 30 words per minute for three minutes.

BUS 110 Office Machines 2 3 0 3

The student will be introduced to machines currently being used in business and industry. The student will learn the techniques, processes and operations of machines such as the ten-key adding machine, calculator, etc. and be able to apply these knowledges.

BUS 120 Accounting I 3 2 0 4

A beginning course in the basic principles and concepts of accounting. Emphasis is on business transactions and their effect on the accounting equation; debits and credits in double-entry accounting; selecting and recording financial data in journals and ledgers; preparing work sheets; balance sheets and income statements and introduction to the basic concepts of internal control.

BUS 115 Business Law I 3 0 0 3

This course is designed for students who need an understanding of substantive business law. The student will be able to define business law terminology and state involvement of business law in the following areas: nature and sources of our legal system, contracts, sales, commercial papers, bailments and agency.

DMK 132 Sales Development 3 2 0 4

The student will be able to apply selling principles through preparation for and demonstration of a sale.

Social Science

SOC 101 Sociology 3 0 0 3

A study of basic sociology principles and of the basic process of group behavior. Includes the study of social interaction, family and group life, social institutions, status and role, culture, population, structure and change, and community structure, both urban and rural.

SOC 102 Principles of Sociology 5 0 0 5

An introductory course to the principles of sociology. An attempt to provide an understanding of culture, collective behavior, community life, social institutions and social change. Presents the scientific study of man's behavior in relation to other men, the general laws affecting the organization of such relationships and the effects of social life on human personality and behavior.

SOC 207 Rural Society 3 0 0 3

A study of selected elements of rural sociology with emphasis on current social changes. The course provides a sociological background for the understanding of rural social changes. Areas of study include rural culture, group relationships, social classes, rural and suburban communities, farm organizations, the communication of agricultural technology, rural social problems, agricultural adjustment and population change.

SOC 211 Marriage and Family 3 0 0 3

This course is designed to aid the student in understanding marriage and family living. The student will study marriage and family relationships and the role families play in the development of children.

SSC 201 Social Science 3 0 0 3

An integrated course in the social sciences, drawing from the fields of anthropology, psychology, history, and sociology.

SSC 202 Social Science 3 0 0 3

A further study of social sciences, with emphasis on economics, political science, and social problems as they relate to the individual.

SSC 205 American Institutions 3 0 0 3

A study of the effect of American social, economic, and political institutions upon the individual as a citizen and as a worker. The course dwells upon current local, national, and global problems viewed in the light of our political and economic heritage.

PSY 110 General Psychology 3 0 0 3

An introduction to the principles of human behavior. Includes a brief history of psychology as a science, basic psychological processes, personality and social behavior, contemporary knowledge of motives, intelligence, learning and emphasis on methods of communications and the understanding of self and others. The beginning concepts of approaches that are therapeutic in the people relationship are presented.

PSY 206 Applied Psychology 3 0 0 3

A study of the principles of psychology that will be of assistance in the understanding of interpersonal relations on the job. Motivation, feelings and emotions are considered with particular reference to on-the-job problems. Other topics investigated are: employee selection, supervision, job satisfaction, and industrial conflicts. Attention is also given to personal and group dynamics so that the student may learn to apply the principles of mental hygiene to his adjustment problems as a worker and a member of the general community.

Faculty and Staff Selection and Certification

The effectiveness of any educational program depends to a large extent on competent, well qualified, highly motivated instructors who have a desire to teach. This is especially true in the community colleges and technical institutes because of the large numbers of low ability, disadvantaged students who attend these institutions. It is necessary for faculty and staff to understand the unique nature and role of the comprehensive institution.

Formal certification of faculty members by the Department of Community Colleges is not required. However, the North Carolina Administrative Code; Title 16, Department of Public Education; Chapter 4; Department of Community Colleges; Subchapter 4C, Section .0202 indicates that:

(1) . . . .

(2) Institutions shall employ faculty members so as to meet Southern Association of Colleges and Schools standards, and the State Board of Education's Standards and Evaluative Criteria, as amended.

(3) Institutions shall determine appropriate teaching and non-teaching loads for faculty and for technical assistants to the faculty so as to meet Southern Association of Colleges and Schools standards and the State Board of Education's Standards and Evaluative Criteria, as amended.

Instructors of the Horticulture Technology program should be able to carry out the objectives of the program and to plan, implement, and evaluate learning experiences essential to the program. Instructors should be well informed of the requirements for employee competency in jobs for which students are being trained so instructors can utilize resource people, field examples, and illustrations as supporting materials in their courses. Faculty members should also be able to counsel students, work with individuals and organizations within the community and, through research, continuing education, and/or professional organizations be aware of the changes developing in the horticulture industry.

As indicated above, teaching loads of faculty should adhere to the standards of the Southern Association of Colleges and Schools and the State Board of Education's Standards and Evaluative Criteria. However, factors to consider in determining teaching and non-teaching work loads for Horticulture Technology instructors include: (1) teaching loads of other instructors in other curriculum areas in the institution, (2) class contact hours, (3) number of preparations, (4) student loads, (5) committee assignments, (6) departmental responsibilities, and (7) other special duties. A full-time load is usually considered to be from 12 to 25 contact hours per week.

It is essential that Horticulture Technology instructors have a knowledge of community development, know how to work and get along with citizens in the community, and be able to form and coordinate a local advisory committee made up of representatives of the horticulture industry in the community and/or region. Much contact is required of instructors with employers, employees, and other individuals if a quality program is to be offered.

Facilities, Equipment, and Instructional Aids

Facilities

Adequate instructional facilities consisting of classrooms, laboratories, lathhouses, storage facilities, and outdoor laboratories are necessary for community colleges and technical institutes to provide a quality program in Horticulture Technology.

Classrooms are needed to provide the lecture and discussion part of courses. The number and size of classrooms will depend on student enrollment, curriculum design, methods and media used in instruction, and whether the classrooms will be used by students in other programs. Classrooms should be attractive, clean, and well lighted, ventilated, heated, air conditioned, and acoustic-proof. Chalkboards, electrical outlets, and means of darkening the room for audiovisual presentations should be conveniently provided.

Laboratories should be conveniently located to classrooms in order to carry out experiments and to practice skills needed by the prospective graduate. Many of the contact hours required in the curriculum are devoted to laboratory demonstrations by instructors and manipulative skills development by students. Laboratories should be well equipped with cabinets, work stations, hot and cold water, gas, electrical outlets, and emergency showers and other safety equipment. A storage room should be located adjacent to each laboratory for equipment storage. All safety rules and regulations must be followed for storing chemicals and other hazardous materials.

A greenhouse equipped with fans, heaters, and automatic misting devices must be available for students to propagate and grow plants. The type, size, and number of greenhouses depends upon the number of students enrolled in Horticulture Technology, the number of students in related curriculums using the greenhouse, the type of greenhouses used in the local area or region, and maintenance requirements.

A headhouse located very conveniently to the greenhouse should be provided for storage of media, soil supplements or amendments, and perhaps some tools and equipment. This facility should be large enough to provide plenty of room for mixing of media, putting media in cans, and preparing plants for propagation. Storage bins, cabinets, work stations, and areas should be included.

A lathhouse using poles and snow fencing makes an ideal facility for placing plants after they come out of the greenhouse to protect them from the sun in summer and cold temperatures in winter. Watering can be done by hand, but it is much more practical and convenient to use automatic sprinklers.

A storage facility is needed to house the many tools and specialized equipment needed for this program. This facility should have a large door to allow equipment to be driven inside. Tools should be placed on the walls for ease in locating. It is necessary to secure the building at all times to reduce the risk of theft.

Land that can be used for outdoor laboratories to grow nursery stock, to experiment with chemicals, to grow various types of turf grasses, to plan and set up drainage and irrigation systems, etc, is a very worthwhile investment for institutions offering Horticulture Technology programs. Practical experiences are essential to students so that they will be competent to perform the skills required when they begin employment.

Equipment

Much specialized equipment is needed for the Horticulture Technology program. Students should become knowledgeable about the use and care of the equipment. Instructors must keep a current inventory of equipment and immediately report any stolen or missing items. Also, as new equipment is developed, efforts should be made to acquaint students with the new equipment and purchases should be made when justified.

A suggested list of equipment needed for the program is included in Appendix G.

Textbooks, References, and Visual Aids

Appropriate textbooks, references, and visual aids are very important for teaching any subject area to insure that current information is presented and that materials are selected that best meet the particular needs of the student. Textbooks, references, and visual aids must be reviewed constantly and updated or supplemented based on new knowledge in the field and the results of research in teaching methods and developing concepts.

The textbooks and references listed for each suggested course in the Horticulture Technology curriculum have been carefully reviewed and selected. From this list, it should be possible to select textbook and reference materials for each course. However, other materials that are not listed may also be appropriate. Whatever teaching materials are used, instructors should select materials that meet course objectives. Materials should always be carefully previewed and studied by instructors before they are used.

The Library

The library is an important source of reference materials for students to use in obtaining additional information on particular subjects assigned by instructors or for students to investigate interest areas on their own. The library should contain up-to-date books, periodicals, and other reference materials related to the Horticulture Technology program as well as other programs. Horticulture Technology instructors and students should be involved in selecting materials for the library and/or approving reference materials for horticulture and related courses.

Characteristics of a quality library include qualifications of the librarian and library assistants; the facilities; the number and type of periodicals, books, and other reference materials; and the staffing and organizational structure. Library facilities should be readily accessible to both full-time and part-time students and faculty not only during instructional hours but during other hours convenient to both students and faculty.

Instructors should plan their instructional process to include students using the library to develop the habit of using it as a learning tool and to help foster a professional attitude which regards libraries as a resource for research endeavors and as good sources of information.

Professional Boards and Associations

It is important that horticulture instructors and students be aware of professional boards and associations in the field of horticulture. Instructors should work closely with these boards and associations because they can offer many benefits to their horticulture program. Some of the benefits include books, references, and other publications; new concepts, processes, techniques, and equipment available in the horticulture field; provide support in investigating the need for a program, in promoting the program, in providing work experience for students, and in placement of graduates; supply resource people to speak to classes; and to host student groups on field trips or for individual student projects.

Early in their studies, students should become aware of the various boards and associations and the services and resources they offer. By becoming acquainted with them and by becoming active or ad hoc members if possible, students can learn quickly of developments in the horticulture industry and become acquainted with persons in the community, region, and state who are active in the field.

Some of the boards and associations include:

1. N. C. Association of Nurserymen
2. N. C. Chapter, American Society of Landscape Architects
3. Landscape League
4. N. C. Landscape Contractors Association
5. Turfgrass Council of North Carolina
6. American Association of Nurserymen

COURSE OUTLINES

COURSE OUTLINE

HOR 135 LANDSCAPE DRAFTING

Developed By

Horticulture Technology Competency Curriculum Committee

June 1979

PROGRAM DEVELOPMENT
DEPARTMENT OF COMMUNITY COLLEGES
STATE BOARD OF EDUCATION
RALEIGH, NORTH CAROLINA

HORTICULTURE 135

Landscape Drafting

DESCRIPTION OF COURSE:

A course designed to provide fundamental knowledge of the principles of drafting. Basic skills and techniques of drafting include the proper use and care of drafting equipment and supplies, lettering, sketching, line technique, geometric construction, instrument drawings of principle orthographic views and dimension lines and numbers. Landscape symbols will also be studied.

COURSE HOURS PER WEEK: Class, 2; Laboratory, 4.

QUARTER HOURS CREDIT: 4.

PREREQUISITE: None.

COURSE OUTCOMES:

Upon the completion of this course the student should pass with a proficiency determined by the institution, by oral and/or written examinations or other methods, the material contained in the outline of instruction. As a minimum a student should:

(1) Identify, properly use, and care for drafting tools and equipment.

(2) List the various types of drafting supplies and describe how and where they are used.

(3) Practice and develop an acceptable degree of skill in freehand lettering of drawings.

(4) Construct line, arcs, and circle relationships and where they apply in drawings.

(5) Draw geometric figures, such as triangles, pentagons, octagons, and other polygons.

(6) Develop an acceptable degree of skill in freehand sketching.

(7) Develop a knowledge of the three views of orthographic drawings.

(8) Visualize hidden parts, planes, and lines, and project these parts for each view.

(9) Develop an acceptable degree of skill in projecting and drawing three orthographic views of objects.

(10) Draw dimension lines and write dimension numbers and notes using appropriate techniques.

(11) Read and use the architect's scale and draw objects to specified scales.

(12) Identify landscape symbols.

OUTLINE OF INSTRUCTION

I. Introduction to landscape drafting

A. Relationship of draftsman to landscape architect

B. Importance of landscape design

1. Aesthetics
2. Functional value
3. Monetary value

C. Graphic language

1. Expresses ideas
2. Records ideas
3. Describes size, shape, and details

D. Methods of expression

1. Orthographic projection
2. Pictorial representation
3. Dimensioning practices

E. Techniques of expression

1. Freehand drawing
2. Instrument drawing

II. Characteristics of instruments, equipment, and supplies

A. Drawing board

1. Surface characteristics
2. Edge characteristics

B. Compasses

1. Friction type
2. Bow
3. Beam
4. Spring bow instrument

C. Straight edges

1. T-square
    a. Fixed-head
    b. Adjustable-head
    c. Blades

D. Dividers

1. Plain
2. Hairspring

E. Triangles

1. Fixed - 30°, 60°, and 45°
2. Adjustable

F. Scales

1. Architect's
2. Engineer's
3. Shape
    a. Triangular
    b. Flat (beveled)

G. Composition of sets

1. Detailer's set
2. Three-bow set

H. Curves

1. Irregular
2. Flexible

I. Drawing pencils

1. Lead hardness
2. Points
3. Line weights

J. Lead pointers

1. Sandpaper
2. Files
3. Mechanical

K. Erasers

1. Pencil type
2. Art gum
3. Pink pearl
4. Ink erasers; eradicators

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L. Pens and staffs

M. Drawing ink

N. Paper fastening devices

  1. Drafting tape
  2. Thumb tacks
  3. Staples

O. Drafting aids

  1. Templates
  2. Erasing machines
  3. Erasing shields
  4. Protractors
  5. Grid paper
  6. Parallel rules

P. Paper

  1. Sketch
  2. Tracing media
     a. Rag paper
     b. Prepared vellums
  3. Tracing cloth
  4. Synthetics

III. Lettering

A. Purpose

  1. Dimensioning
  2. Notes

B. Characteristics of good lettering

  1. Uniformity
  2. Neatness
  3. Good construction
  4. Correct proportions
  5. Proper spacing

C. Steps to good lettering

  1. Knowledge of letter formation
  2. Knowledge of composition
  3. Persistent practice

D. General division of letters

1. Built-up
2. Single stroke
    a. Ease of execution
    b. Legible

E. Lettering layout

1. Horizontal guide lines to establish height of letters
2. Vertical guide lines to assist in keeping vertical strokes upright
3. Case of letters
    a. Upper
    b. Lower
4. Letter groups
    a. Straight stroke
    b. Inclined straight stroke
    c. Circle stroke
    d. Combination stroke
5. Numbers
    a. Whole numbers
    b. Fractions
6. Proportions
    a. Extended
    b. Compressed
    c. Stability
7. Lettering devices
    a. Pencils
    b. Pens
    c. Mechanical
        (1) Leroy, etc.
        (2) Templates
8. Composition in lettering
    1. Spacing between letters
    2. Spacing between words
    3. Spacing between sentences

IV. Sketching

A. Freehand drawing principles

1. Definition
2. Purpose
    a. Record ideas quickly
    b. Present ideas quickly
    c. Aid in visualization

B. Characteristics

  1. Accurate description
  2. Proper lines
    a. Alphabet of lines
    b. Contrast of lines
    c. Proper proportions
    d. Neatness

C. Materials used

  1. Pencils
  2. Paper
    a. Plain
    b. Co-ordinate
      (1) Squared
      (2) Isometric
      (3) Perspective grids
  3. Erasers

D. Techniques of freehand drawing

  1. Straight lines
  2. Inclined lines
  3. Curved lines
  4. Circles and arcs

E. Line weights and uses

  1. Layout (construction) line
  2. Materials line (symbols)
  3. Dimension line
  4. Object line
  5. Center line
  6. Hidden line

F. Pictorial sketching and drawing

  1. Definition
  2. Classification
    a. Axonometric
    b. Oblique
    c. Perspective
  3. Techniques of oblique drawing

V. Instrument drawing

A. Purpose

B. Types

1. Isometric
2. Perspective
3. Plan
4. Elevation
5. Section
6. Detail

C. Materials and instruments

1. Characteristics of proper use of instrument
   a. Good form
   b. Good habits
   c. Facility with instruments
   d. Accuracy of production
   e. Speed of production
2. Architect's scale
   a. Characteristics
   b. Reading the scale
   c. Using the scale
   d. Care of scale
3. Drawing table
   a. Placing and fastening paper
   b. Instrument placing
4. Pencils
   a. Proper grade
   b. Points
   c. Sharpening
   d. Cleaning
5. T-square
   a. Proper handling
   b. Purpose
   c. Drawing lines
6. Triangles
   a. 30° - 60°
   b. 45°
   c. Drawing directions
   d. Obtaining combination angles
7. Layout sheets
   a. Borders
   b. Title
8. Dividers
   a. Holding
   b. Adjusting
   c. Correct use
9. Compasses
   a. Adjusting
   b. Sharpening
   c. Setting to radius
   d. Drawing circles and arcs

10. Ruling pen
11. Erasers
12. Erasing shield
13. Special instruments
    a. Protractors
    b. Parallel rule
    c. Proportional dividers
    d. Templates

VI. Geometric construction

A. Line relationships and connections: intersections

1. Straight lines
2. Parallel lines
3. Perpendicular lines
4. Tangents to a circle
    a. Locations of point of tangency
    b. Cases of tangents

B. Geometry of straight line figures

1. Dividing of lines
    a. Bisecting lines
    b. Dividing into three or more equal parts
2. Layout of angles
3. Dividing angles
4. Triangles
    a. Construction
    b. Transfer
5. Polygons
    a. Construction
    b. Transfer

C. Geometry of curved lines

1. Definition
2. Construction by parts of arcs and chords
3. Plane curved geometrical figures
    a. Circles
    b. Ellipse
    c. Parabola
    d. Hyperbola
    e. Cycloidal

VII. Orhtographic projection

A. Purpose

B. Theory of orthographic projection

C. Definition

D. Principle planes

1. Horizontal
2. Frontal
3. Profile
4. Relationships of planes

E. Views

1. Front
2. Top
3. Slide
4. Proper selection of view for description
5. Combination of views
6. Alternate positions of views

F. Space dimensions

1. Height
2. Width
3. Depth

G. Classification of surfaces and lines

1. Normal
2. Inclined
3. Oblique

H. Viewing of features

1. Edge views
2. Surface limits
3. Intersection of surfaces

I. Representing features

1. Alphabet of lines
    a. Object line
    b. Hidden lines
    c. Center line
2. Drawing of lines
    a. Weights
    b. Contrast
    c. Precedence

J. Angles of projection

K. Orthographic sketching

L. Orthographic reading

1. Definition
2. Procedure
   a. Orientation of views
   b. Idea of outstanding features
   c. Individual features
   d. Complicated features
   e. Relationship between elements
   f. Rereading

M. Orthographic instrument drawing

1. Spacing of views
   a. Preliminary measurement
   b. Preliminary planning
      (1) Adjustment of measurement
      (2) Horizontal spacing
      (3) Vertical spacing
      (4) Blocking in views
      (5) Selection of reference lines
2. Process of projection
   a. Carrying views together
   b. Methods
      (1) Use of dividers
      (2) Measuring
      (3) Miter projection
   c. Projecting surfaces bounded by linear edges
      (1) Corners
      (2) Bounding edges
   d. Projecting elliptical boundaries
      (1) Points method
      (2) Axis method
      (3) Projection to adjacent view
3. Order of drawing
   a. Selection of views
   b. Drawing to size
   c. Spacing of views
   d. Drawing characteristic features
   e. Showing details
   f. Placing of title
   g. Allowance for border
   h. Checking drawing for accuracy

VIII. Identification of landscape symbols

A. Representative plant symbols

1. Shade and ornamental trees
2. Specimen plants
3. Hedge

4. Corner shrubs
5. Flagstone walks, terraces, etc.
6. Foundation plants
7. Under window plants
8. Edge or facer plants
9. Climbers and ground covers

B. Representative plant forms

1. Horizontal
2. Globular
3. Upright
4. Modified

C. Representative plant sizes

1. 8 - 10"
2. Up to 3 feet
3. 3 to 6 feet
4. Over 6 feet

SUGGESTED TEXTS:

Giesecke, F. E. and others. *Technical Drawing*. New York: Macmillan Company, Current Edition.

Jensen, C. H., and F. H. S. Mason. *Drafting Fundamentals*. New York: McGraw-Hill, Inc., Current Edition.

SUGGESTED REFERENCES:

Eckbo, Garrett. *The Art of Home Landscaping*. New York: F. W. Dodge Corporation, Current Edition.

French, Thomas E., and Charles J. Vierck. *Engineering Drawing for Students and Draftsmen*. New York: Macmillan Company, Current Edition.

Nelson, Jr., William R. *Landscaping Your Home*. Urbana, IL: University of Illinois Press, Current Edition.

Segel. Yonny. *Drafting Made Simple*. Garden City, NY: Doubleday and Company, Inc., Current Edition.

COURSE OUTLINE

AGR 170 PLANT SCIENCE

Developed By

Horticulture Technology Competency Curriculum Committee

June 1979

PROGRAM DEVELOPMENT
DEPARTMENT OF COMMUNITY COLLEGES
STATE BOARD OF EDUCATION
RALEIGH, NORTH CAROLINA

AGRICULTURE 170

Plant Science

DESCRIPTION OF COURSE:

An introductory general botany and plant science course covering the fundamental principles of the reproduction, growth, functions, and development of seed bearing plants.

COURSE HOURS PER WEEK: Class, 5; Laboratory, 2.

QUARTER HOURS CREDIT: 6

PREREQUISITE: None.

COURSE OUTCOMES:

Upon the completion of this course the student should pass with a proficiency determined by the institution, by oral and/or written examinations or other methods, the material contained in the outline of instruction. As a minimum a student should:

(1) Describe the historical background of plant science.

(2) Name the fields of plant science.

(3) Define the terms "annuals," biennials," and "perennials."

(4) Draw the different parts of a seed.

(5) List the requirements for seed germination.

(6) Identify the various methods of fruit and seed dispersal.

(7) Name the various structures of flowering plants.

(8) Identify and describe the functions of the parts of a cell.

(9) Describe the difference between inhibition and osmosis.

(10) Demonstrate the process of osmosis in a laboratory experiment.

(11) Describe the formation of new cells through the process of mitosis.

(12) Name and describe the functions of various types of roots found in a root system.

(13) Identify the three regions of roots: cell division, cell elongation, and cell maturation.

(14) Describe the process of absorption of materials by roots.

(15) Name and describe the function of specialized roots.

(16) List the chief functions of stems.

(17) Provide examples of woody and herbaceous stem types.

(18) Name and describe the functions of the different types of buds.

(19) Define and give examples of specialized stems.

(20) List the external differences between stems and roots.

(21) Draw the internal structure of woody stems.

(22) Define the functions of the internal parts of woody stems.

(23) Describe the differences between Monocotyledons and Dicotyledons.

(24) List and define the chemical properties of wood.

(25) List examples of softwoods and hardwoods.

(26) Determine the specific gravity of different types of wood.

(27) Provide examples of the three types of arrangement of leaves.

(28) List and describe the function of the external parts of leaves.

(29) Draw the internal structure of leaves.

(30) List four examples of specialized leaves.

(31) Describe the process of leaf fall of plants.

(32) Illustrate the processes of photosynthesis and transpiration.

(33) List the factors that affect the rate of transpiration in plants.

(34) List the sixteen essential soil elements.

(35) Define "micronutrients and "macronutrients."

(36) List the physiological functions of soil elements.

(37) Define "carbohydrates," "fats," and "proteins."

(38) Describe the functions of digestion and respiration in plants.

(39) Illustrate the nature of plant growth.

(40) List the internal factors of plant growth and describe each factor.

(41) Illustrate the effect of light, temperature, moisture, and soil nutrients on plant growth.

(42) Set up probability charts for several crosses of plants to determine color, size, etc.

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OUTLINE OF INSTRUCTION

I. The nature of plant science

   A. Historical background

   B. Descriptive sciences

   C. Fields of plant science

      1. Bacteriology
      2. Agronomy
      3. Horticulture
      4. Olericulture
      5. Floriculture

   D. Vocational opportunities in plant science

   E. Plants as living organisms

      1. Characteristics peculiar to living things

   F. Kinds of plants

      1. Annuals
      2. Biennials
      3. Perennials

   G. Plant kingdom

      1. Thallophyta
      2. Embryophyta

II. Seed structure and germination

   A. Seed structure

1. Embryo
2. Seed coat
3. Monocotyledons
4. Dicotyledon

B. Seed germination

1. Dormancy
2. Quiescence
3. Seed scarification

C. Seed viability

D. Physiology of seed germination

1. Moisture
2. Temperature
3. Oxygen

E. Fruit and seed dispersal

1. Wings
2. Plumes
3. Spines and barbs
4. Others

F. Economic importance of seeds

1. Foods
2. Drugs
3. Oil
4. Others

III. Gross structure and activities of flowering plants

A. Structures of flowering plants

1. Roots
2. Stems
3. Leaves
4. Flowers

B. Differences in plants

IV. The microscopic structure of plants:

A. Cells

1. Cellular organization of plants
    a. Differentiation or maturation
    b. Cell theory
    c. Multicellular
    d. Unicellular
2. Size of cells

        3. Structure of cells
            a. Cell wall
            b. Protoplast
            c. Ergastic substances

    B. Tissues

        1. Simple permanent tissues
        2. Complex permanent tissues

V. Physiological activities of plant cells

    A. Physical structure of protoplasm

        1. Sol
        2. Gel

    B. Chemical nature of protoplasm

    C. Absorption of water by cells

        1. Imbibition
        2. Osmosis
            a. Diffusion pressure
            b. Differentially permeable
            c. Turgor pressure
            d. Turgidity

    D. Plasmolysis

    E. Absorption of solutes

        1. Simple diffusion
        2. Active transport

    F. Formation of new cells

        1. Mitosis
            a. Interphase
            b. Prophase
            c. Metaphase
            d. Anaphase
            e. Telophase
            f. Daughter cells
        2. Rate of mitosis
        3. Significance

VI. Roots and the relation of roots to soils

    A. Root systems

1. Primary root
2. Secondary roots
3. Adventitious roots
4. Diffuse root systems
5. Taproot system

B. Root anatomy and growth

1. Rootcap
2. Region of cell division
3. Region of cell elongation
4. Region of cell maturation

C. Roots and soils

1. Mineral particles
2. Soil air
3. Water
    a. Gravitational water
    b. Capillary
4. Leaching
5. Organic matter
6. Soil solutes
7. Soil organisms

D. Absorption of materials by roots

1. Passive water absorption
2. Active water absorption
3. Guttation

E. Morphology and growth of roots in relation to absorption

F. Economic significance of roots

G. Specialized roots

1. Prop roots
2. Climbing roots
3. Aerial
4. Suckers

VII. Origin and gross structure of stems

A. Origin and nature of stems

1. Epicotyl
2. Hypocotyl
3. Chief function of stems of flowering plants
    a. Conduction
    b. Support

B. External structure of stems

1. Stem types
    a. Woody
    b. Herbaceous
2. Buds
    a. Axillary
    b. Lateral
    c. Terminal
    d. Adventitious
    e. Bud scales
    f. Flower buds
    g. Leaf buds
    h. Mixed buds
    i. Disbudding

C. Stem surfaces

D. Specialized stems

1. Rhizomes
2. Tubers
3. Bulbs
4. Corms
5. Tendrils
6. Twiners
7. Stolens
8. Thorns

E. External differences between roots and stems

VIII. Internal structure of stems

A. Internal structure of stems

1. Protoderm
2. Procambium
3. Ground meristem

B. Internal structure of woody stems

1. Bark
2. Xylem
3. Pith
4. Cambium
5. Cork cambium

C. Primary tissues of woody stems

1. Secondary origin

2. Primary tissues
    a. Epidermis
    b. Cortex
    c. Phloem
    d. Xylem
    e. Pith

D. Secondary tissues of wood stems

1. Periderm
2. Bark
3. Growth rings

E. Internal structure of herbaceous stems

1. Monocotyledons
2. Dicotyledons

F. Leaf traces and leaf gaps

1. Petiole
2. Leaf traces
3. Leaf gap

IX. Wood and the economic uses of stems

A. Chemical properties of wood

1. Cellulose
2. Microfibrils
3. Lignin
4. Hemicelluloses
5. Extractives

B. Physical properties of wood

1. Specific gravity
    a. Hardwoods
    b. Softwoods
2. Seasoning
3. Kilns

C. Durability of woods

D. Wood surfaces

1. Nonporous
2. Porous
3. Ring porous
4. Diffuse-porous

E. Uses of wood

X. Conduction of materials by stems

  A. Translocation

  B. Root pressure

  C. Capilarity

  D. Cohesion theory

  E. Stem pressure

  F. Mass flow theory

XI. The origin and structure of leaves

  A. Arrangement of leaves

    1. Alternate
    2. Opposite
    3. Whorled

  B. External structure of leaves

    1. Petiole
    2. Blade
    3. Stipules
    4. Sheaths

  C. Arrangement of veins

    1. Parallel
    2. Pinnate
    3. Palmate

  D. Leaf blades

    1. Compound
    2. Simple

  E. Margin arrangements

    1. Entire
    2. Toothed
    3. Lobed

  F. Internal structure of leaves

    1. Epidermis
    2. Mesophyll
    3. Veins (Bundle sheaths)

G. Specialized leaves

1. Bud scales
2. Spines
3. Bulb scales
4. Tendrils
5. Insectivorous or carnivorous

H. Economic importance of leaves

XII. Physiology of leaves

A. Leaf fall

1. Evergreen plants
2. Deciduous plants

B. Color pigment of leaves

1. Chlorophyll a
2. Chlorophyll b

C. Photosynthesis

1. As process of food manufacture
2. Humus theory
3. Distinctive features of photosynthesis
4. Course of the process
5. Factors influencing photosynthesis
6. Leaves as photosynthetic machines

D. Transpiration

1. Evaporation of water
2. Types of transpiration
    a. Stomatal
    b. Lenticular
    c. Cuticular
3. When transpiration occurs
4. Disadvantage of transpiration
5. Transpiration and plant cultivation

E. Guttation

XIII. Metabolism

A. Mineral nutrition of green plants

1. Essential soil elements
    a. Micronutrients
    b. Macronutrients

2. Physiological function of soil elements
    a. Magnesium
    b. Nitrogen
    c. Sulfur
    d. Phosphorus
    e. Calcium
    f. Potassium
    g. Iron
    h. Others

B. Foods and food synthesis

1. Carbohydrates
2. Fats
3. Proteins

C. Other organic compounds

1. Enzymes
2. Vitamins
3. Hormones
4. Essential soils
5. Organic acids

D. Digestion

1. Process involved
2. Kinds of digestive enzymes
3. Economic importance of enzymes

E. Respiration

1. Process involved
2. Aerobic respiration
3. Anaerobic respiration
4. Respiration versus photosynthesis
5. Relation of aerobic to anaerobic respiration
6. Chemical mechanism of respiration

XIV. Growth and irritability

A. Nature of plant growth

1. Meaning of growth
2. Growth rates and measurement
3. Distribution of growth

B. Internal factors of plant growth

1. Hereditary nature of plants
2. Growth regulators

3. Fundamentals of auxins
4. Food reserves

C. External factors of plant growth

1. Light
2. Temperature
3. Moisture
4. Soil nutrients
5. Foods
6. Oxygen
7. Carbon dioxide
8. Chemical agents in soils
9. Other living organisms

D. Irritability in plants

1. General nature of irritability
2. Reception of stimuli by plants
3. Kinds of reactions in plants
  a. Growth reactions
  b. Turgor reactions

XV. Genetics and plant breeding

A. Heredity

1. Variation
  a. Environmental
  b. Hybridization
  c. Mutations

B. Genetics

1. Studies of mendel
2. Monohybrid crosses
3. Law of unit characters
4. Law of dominance
5. Law of segregation
6. Dihybrid cross
7. Law of independent
8. Cytological basis of inheritance
9. Chemical basis of inheritance
10. Incomplete dominance
11. Multiple genes
12. Linkage
13. Crossing over
14. Sex inheritance
15. Mutations

C. Plant breeding

SUGGESTED TEXT:

Fuller, Harry J., and Zane B. Carothers. *The Plant World*. New York: Holt, Rinehart and Winston, Inc., Current Edition.

SUGGESTED REFERENCES:

Carter, Ryerson and Barnard. *Plant Science in Agriculture*. Bozeman, MT: Montana State University, Current Edition.

Coulter, Merle C. and Howard J. Dittmer. *The Story of the Plant Kingdom*. Chicago: University of Chicago Press, Current Edition.

Janick, Jules. *Plant Science*. San Francisco: W. H. Freeman and Company, Current Edition.

Leopold, A. *Plant Growth and Development*. New York: McGraw-Hill Book Company, Current Edition.

Torrey, John G. *Development in Flowering Plants*. New York: Macmillan Company, Current Edition.

Wilson, C. L., W. E. Loomis, and T. A. Steeves. *Botany*. New York: Holt, Rinehart and Winston, Inc., Current Edition.

BUSINESS 109

Business Mathematics *

DESCRIPTION OF COURSE:

This course was designed to provide a review of the fundamentals of arithmetic and their practical application to business problems in the processes of trading, operating, ownership, financing, investing, summarizing, and analyzing. Topics covered include cash and trade discounts, markup, interest, taxes, and pertinent uses of mathematics in business and industry.

COURSE HOURS PER WEEK: Class, 5; Laboratory, Optional.

QUARTER HOURS CREDIT: 5

PREREQUISITE: None.

MAJOR DIVISIONS OF COURSE CONTENT:

I. Fundamentals of Arithmetic

II. The Mathematics of Trading

III. The Mathematics of Operating

IV. The Mathematics of Finance

V. The Mathematics of Summary and Analysis

Other Topics (Time Permitting)

The Mathematics of Business Ownership

The Mathematics of Investment

The Mathematics of Summary and Analysis (continued)

SUGGESTED TEXTBOOKS:

Kaliski, Burton S. Business Mathematics. New York: Harcourt Brace Jovanovich, Inc., Current Edition.

Moran, Jr., M. Marcus and William E. Aubuchon. Applied Business Mathematics. Rockleigh, NJ: Holbrook Press, Inc., Current Edition.

Synder, Liewellyn R. and William Jackson. Essential Business Mathematics. New York: McGraw-Hill Book Company, Current Edition.

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*This is an abstract of the Business Mathematics syllabus. For a complete copy, write to Program Development Division, Department of Community Colleges, Education Building, Raleigh, NC 27611.

ENGLISH 101

Grammar*

DESCRIPTION OF COURSE:

Designed to aid the student in the improvement of self-expression through writing. Emphasis is on grammar, diction, sentence structure, punctuation and spelling. It is intended to stimulate students in applying the basic principles of English grammar in their day-to-day situations in industry and social life.

COURSE HOURS PER WEEK: Class, 3; Laboratory, 0.

QUARTER HOURS CREDIT: 3

PREREQUISITE: None.

MAJOR DIVISIONS OF COURSE CONTENT:

I. Parts of speech

II. Correct word choice

III. Sentence structure

IV. Punctuation

V. Paragraphs and topic sentences

SUGGESTED TEXTBOOKS:

Aurner, Robert R. and Paul S. Burtners. Practical English for Colleges. Cincinnati; South-Western Publishing Company, Current Edition.

Graham, Sheila Y. Harbrace College Workbook. Form 7A and 7B. New York: Harcourt Brace Jovanovich, Current Edition.

Hodges, John C. and Mary E. Whitten. Harbrace College Handbook. New York: Harcourt Brace Jovanovich, Current Edition.

Perrin, Porter G. and George H. Smith. Handbooks of Current English. Glenview, Illinois: Scott, Foresman and Company, Current Edition.

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*This is an abstract of the English Grammar syllabus. For a complete copy, write to Program Development Division, Department of Community Colleges, Education Building, Raleigh, NC 27611.

COURSE OUTLINE

HOR 144 PLANT PROPAGATION

Developed By

Horticulture Technology Competency Curriculum Committee

June 1979

PROGRAM DEVELOPMENT
DEPARTMENT OF COMMUNITY COLLEGES
STATE BOARD OF EDUCATION
RALEIGH, NORTH CAROLINA

HORTICULTURE 144

Plant Propagation

DESCRIPTION OF COURSE:

A study of basic concepts and principles of sexual and asexual propagation. Techniques are learned through practical exercises conducted in laboratory sessions. Emphasis is given to those propagation methods widely utilized in the horticulture industry.

COURSE HOURS PER WEEK: Class, 3; Laboratory, 2.

QUARTER HOURS CREDIT: 4.

PREREQUISITE: None.

COURSE OUTCOMES:

Upon the completion of this course the student should pass with a proficiency determined by the institution, by oral and/or written examinations or other methods, the material contained in the outline of instruction. As a minimum a student should:

(1) Differentiate between asexual and sexual plant propagation.

(2) Identify and differentiate the many methods of plant propagation.

(3) Describe the importance of plant propagation principles applicable to horticulture plant production.

(4) Select proper propagating stock.

(5) Have knowledge of propagating structures and equipment.

(6) Have knowledge of propagating systems.

(7) Maintain and repair propagating structures and equipment.

(8) Make propagation and seed sowing schedules.

(9) Sow seed in appropriate containers.

(10) Transplant seedlings to pots, flats, etc.

(11) Label planted specimens.

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OUTLINE OF INSTRUCTION

I. Introduction

   A. The nature of and need for propagation

      1. Origin of plants
      2. Plant improvement

   B. Life cycle of plants

      1. Life processes
      2. Sexual reproduction
      3. Asexual reproduction

   C. Understanding the sexual cycle (meiosis)

      1. Stages or phases of cycle
      2. Duplication of phases

   D. Understanding the asexual cycle (mitosis)

      1. Vegetative phase of plants
      2. Cellular basis for propagation

   E. Types of life cycles

      1. Annual
      2. Biennial
      3. Perennial

   F. Plant nomenclature and plant classification

II. Facilitating propagation

   A. Propagating structures

      1. Greenhouses
      2. Hotbeds
      3. Cold frame
      4. Lath houses
      5. Miscellaneous structures

   B. Media for propagating plants

      1. Characteristics of desirable media
      2. Soil and soilless mixtures
      3. Supplementary fertilizers

C. Preplanting soil treatments

   1. Purpose of treatment
   2. Kinds of soil treatment
   3. Methods of treatment
   4. Temperatures required for adequate soil treatment

D. Some factors affecting propagation

   1. Soil mixtures
   2. Water quality
   3. Soil pH
   4. Rooting materials

E. Containers for growing plants

III. Sexual reproduction

A. Origin and development of seed

   1. Life cycle of seed bearing plants
   2. Pollination
   3. Fruit and seed development--factors that influence
      a. Response to pollination
      b. Flower characteristics
   4. Maturation
   5. Apomixes (Spore development)

B. Principles of propagation by seed

   1. The germination process
   2. Determination of seed quality
   3. Effect of dormancy upon germination
   4. Effect of environmental factors upon germination

C. Techniques of propagation by seed

   1. Seed testing
   2. Pre-conditioning to stimulate germination
   3. Disease control during germination
      a. Common problems
      b. Types of treatment
      c. Methods of treatment
   4. Indoor seeding
   5. Growing seedlings in field nurseries
      a. Seed bed culture
      b. Nursery row culture

D. Plant variety protection act

E. Seed production techniques for producing genetically pure seed

1. Use of seedlings in propagation
2. Pollination in plants
   a. Self-pollination
   b. Cross-pollination
   c. Prevention of self pollination
3. Methods of producing seed from herbaceous plants
   a. Isolation
      (1) Roguing
      (2) Testing
   b. Seed certification
   c. Production of vegetable and flower seed
   d. Production of seed for hybrid cultivars
4. Controlled pollination systems

F. Propagating woody perennials

1. Propagation in natural setting
2. U.S.D.A. requirements for production of nursery plants
3. Seed tree selection
4. Progeny testing
   a. Objectives
   b. Aspects of progeny testing
   c. Hybrid seed production

G. Techniques of seed handling

1. Harvesting and handling commercial seed
2. Harvesting seed of herbaceous plants
3. Harvesting tree and shrub seed
4. Seed storage
   a. Storage requirements
   b. Factors affecting vitality

IV. Asexual reproduction

A. Nature and importance of asexual reproduction

1. Definition
2. Basic reproductive process

B. Propagation by cuttings

1. Classification of cuttings
   a. Location of plant where taken
   b. Type of material
2. Stem cutting
3. Leaf and leaf-bud cuttings
4. Root cuttings
5. Cultured stocks
6. Storage of rooted cuttings
7. Use of growth regulators
   a. Types
   b. Modes of application

C. Propagation by layerage

   1. Methods
   2. Procedures

D. Propagation by separation

   1. Bulbs
   2. Corms

E. Propagation by division

   1. Tubers
   2. Tuberous roots
   3. Rhizomes
   4. Stolens
   5. Runners

F. Propagation by grafting and budding

   1. Terminology
   2. Selection and storage of graft wood
   3. Kinds of grafts
   4. Grafting tools and materials
   5. Budding techniques

V. Propagation of specific plants

A. By seed

B. By vegetative parts

   1. Fruit and nut trees
   2. Ornamental plants
   3. Woody vines

SUGGESTED TEXT:

Hartmann, Hudson T. and Dale E. Kester. Plant Propagation Principles and Practices. Englewood Cliffs, NJ: Prentice-Hall, Inc., Current Edition.

SUGGESTED REFERENCES:

Christopher, E.P. The Pruning Manual. New York: Macmillan Company, Current Edition.

Free, Montague. Plant Propagation in Pictures. Garden City, NY: American Garden Guild, Inc., and Doubleday and Company, Current Edition.

Mahlestede, John P. and Ernest S. Haber. Plant Propagation. New York: John Wiley and Sons, Inc., Current Edition.

Nelson, Kennard S. Flower and Plant Production. Danville, IL: The Interstate Printers & Publishers, Inc., Current Edition.

The Ball Red Book. West Chicago, IL: George J. Ball, Inc., Current Edition.

Wells, James S. Plant Propagation Practices. New York: Macmillan Company, Current Edition.

COURSE OUTLINE

HOR 147 INDOOR PLANTS

Developed By
Horticulture Technology Competency Curriculum Committee

June 1979

PROGRAM DEVELOPMENT
DEPARTMENT OF COMMUNITY COLLEGES
STATE BOARD OF EDUCATION
RALEIGH, NORTH CAROLINA

HORTICULTURE 147

Indoor Plants

DESCRIPTION OF COURSE:

A study of the identification, selection, cultural requirements, and maintenance of plants used for indoor settings in residences, shopping centers, commercial buildings, and other dwellings. Emphasis is also placed on implementing interiorscape plans.

COURSE HOURS PER WEEK: Class, 2; Laboratory, 4.

QUARTER HOURS CREDIT: 4.

PREREQUISITE: HOR 135, Landscape Drafting.

COURSE OUTCOMES:

Upon the completion of this course the student should pass with a proficiency determined by the institution, by oral and/or written examinations or other methods, the material contained in the outline or instruction. As a minimum a student should:

(1) Identify plants by common and scientific name (annuals, biennials, perennials, etc.).

(2) Use resource material to identify unknown plants which cannot be identified by visual inspection.

(3) Determine cultural requirements of plants (light, soil, moisture, temperature, etc.).

(4) Read dimension lines, numbers, and notations on interiorscape plans.

(5) Follow directions of supervisor in carrying out interiorscape plans.

(6) Properly use and maintain specialized indoor plants.

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OUTLINE OF INSTRUCTION

I. Introduction

    A. Indoor plant industry

    B. Uses of indoor plants

    C. Interiorscapes

II. Identification of indoor plants

  A. Foliage plants

  B. Flowering plants

III. Cultural requirements

  A. Light

  B. Planting media

  C. Air

  D. Temperature

  E. Water

  F. Pests and diseases

  G. Fertilization

  H. Pinching, pruning, and training

  I. Hanging basket culture

IV. Pots, planters, and plant stands

  A. Types

  B. Characteristics

  C. Use

V. Interiorscape design

  A. Dimension lines

  B. Dimension numbers

  C. Notations

  D. Views

  E. Plant and material selection

    1. Types
    2. Amount

VI. Implementing interiorscape plants

  A. Container preparation

    1. Waterproofing
    2. Use of appropriate media
    3. Fertilizing
    4. Planting
    5. Mulching
    6. Watering

  B. Clean-up and inspection of completed job

VII. Specialized indoor plants (their characteristics and use)

  A. Bonsai

  B. Terrariums and dish gardens

  C. Indoor fluorescent gardening

  D. African violets

  E. Cacti and succulents

  F. Orchids

  G. Carnivorous plants and other oddities

SUGGESTED TEXTS:

Mott, Russell C. The Total Book of House Plants. New York, NY: Delacort Press, Current Edition.

Wright, Michael and Dennis Brown. The Complete Indoor Gardener. Westminister, MD: Random House, Inc., Current Edition.

SUGGESTED REFERENCES:

Bauer, Robert C. Gardens in Glass Containers. Nashville, TN: Hearthside Press, Inc., Current Edition.

Crockett, James. Crockett's Indoor Garden. Waltham, MA: Little, Brown, and Company, Inc., Current Edition.

Elbert, George and Virginia Elbert. Plants That Really Bloom Indoors. New York: Simon & Schuster, Inc., Current Edition.

Flowering Plants for Modern Living. Kalamazoo, MI: Merchants Publishing Company, Current Edition.

Foliage Plants for Modern Living. Kalamazoo, MI: Merchants Publishing Company, Current Edition.

Hanging Plants for Modern Living. Kalamazoo, MI: Merchants Publishing Company, Current Edition.

Kramer, Jack. *One Thousand Beautiful House Plants and How to Grow Them*. Caldwell, NJ: Morrow, William & Company, Current Edition.

McDonald, Elvin. *The World Book of House Plants*. New York: Popular Library Books, Inc., Current Edition.

Sunset Editors. *How to Grow House Plants*. Menlo Park, CA: Lane Publishing Company, Current Edition.

COURSE OUTLINE

AGR 201 AGRICULTURAL CHEMICALS

Developed By

Horticulture Technology Competency Curriculum Committee

June 1979

PROGRAM DEVELOPMENT
DEPARTMENT OF COMMUNITY COLLEGES
STATE BOARD OF EDUCATION
RALEIGH, NORTH CAROLINA

AGRICULTURE 201

Agricultural Chemicals

DESCRIPTION OF COURSE:

A study of agricultural chemicals--their importance, ingredients, formulation, laws, and application with emphasis upon the effective and safe utilization of chemicals in agricultural pest control. Particular emphasis is placed on weed identification and the chemicals utilized for weed control.

COURSE HOURS PER WEEK: Class, 3; Laboratory, 2.

QUARTER HOURS CREDIT: 4.

PREREQUISITE: CHM 101, Chemistry.

COURSE OUTCOMES:

Upon the completion of this course the student should pass with a proficiency determined by the institution, by oral and/or written examinations or other methods, the material contained in the outline of instruction. As a minimum a student should:

(1) Describe the importance of agricultural chemicals.

(2) List the various types of control of pests.

(3) Discuss the history of agricultural chemical use.

(4) Explain how tolerances are determined.

(5) Explain how pesticides are rated according to toxicity and persistence.

(6) Discuss pesticide registration.

(7) List the beneficial and detrimental effects of pesticides in regards to agricultural production and our environment.

(8) Discuss the laws affecting applicator usage of pesticides.

(9) Define various terms associated with chemical terminology.

(10) List major safety factors in handling and using chemicals.

(11) Interpret pesticide labels correctly.

(12) Identify facts contained on a pesticide label.

(13) Identify the various weeds affecting horticultural crops.

(14) List various herbicides that control different types of weeds.

(15) State the difference between preplanting, preemergence, and postemergence.

(16) Explain why timing of a pesticide application is important.

(17) List types of chemicals used to alter or change normal crop growth processes.

(18) List climatic factors affecting pesticide application.

(19) List factors an applicator must consider when choosing the appropriate pesticide.

(20) Distinguish between general use and restricted use pesticides.

(21) List the types of pesticide formulations.

(22) Discuss advantages, disadvantages, and principle uses of various types of formulations.

(23) List the types of equipment used for applying pesticides.

(24) Calibrate the various types of application equipment.

(25) Demonstrate the proper use of equipment.

(26) Describe the importance of drift control.

(27) List safety precautions to observe when cleaning and storing equipment after use.

(28) Calculate problems involving pesticide equipment calibration.

(29) Name methods for disposal of pesticides and pesticide containers.

(30) List the major factors affecting pesticide application.

(31) Calculate problems determining amounts of wettable powder and other formulations to use.

(32) List reasons for keeping records of pesticide use.

(33) List items of information needed for recordkeeping.

(34) Name common claims brought against applicators and/or owners.

(35) Discuss insurance for pesticide mishaps.

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OUTLINE OF INSTRUCTION

I. Ecology

  A. Man's environment

    1. Use
    2. Misuse

  B. Pollution

    1. Origin
    2. Current status

  C. Chemicals and our environment

    1. Toxicity
    2. Persistance

II. Types of control

  A. Natural

  B. Biological

  C. Cultural

  D. Mechanical and physical

  E. Chemical

III. Importance of agricultural chemicals

  A. Food production

  B. Food protection and storage

  C. Public health

  D. Plant protection

IV. History of agricultural chemicals

  A. Earliest pesticides

  B. 1860's to 1880's

  C. Early 1900's

  D. 1940 to present

V. Development of agricultural chemicals

  A. Initial testing

B. Registration and labeling

C. Tolerances

D. Cost

VI. Laws regulating chemicals and application principles

A. Insecticide Act of 1910

B. Federal Insecticide, Fungicide and Rodenticide Act of 1947

C. Federal Environmental Pesticide Control Act of 1972

D. North Carolina laws

VII. Chemical terminology

A. Insecticides

B. Herbicides

C. Fungicides

D. Pesticides

E. Rodenticides

F. Miticides

G. Nematicides

H. Growth regulators

I. Defoliants

J. Fumigants

K. Deposit

L. Residue

M. Tolerance

N. Certification

O. Pest

VIII. Safety in using chemicals

A. Rules

- B. State and U. S. Government regulations
- C. Toxicity ratings
- D. Handling chemicals
- E. Application procedures
- F. Respirators and safety equipment
- G. Container disposal
- H. Symptoms of poisoning

IX. Chemical labels

- A. Label development
- B. Information contained in labels
- C. Key words and phrases

X. Weed identification and control

- A. History of weed control and herbicide use
- B. Impact on plant production
- C. Types of control
  1. Chemical
  2. Non-chemical
- D. Identification of noxious weeds
- E. Herbicides
  1. Classification and formulations
  2. Properties
  3. Selectivity for various weeds
  4. Factors affecting herbicide rates and activity
  5. How herbicides kill plants
  6. Application procedures and safety factors
  7. Laws affecting use

XI. Plant growth regulators, defoliants, and desiccants

- A. Definitions
- B. Formulations
- C. Selectivity

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D. Application procedures and safety factors

E. Laws affecting use

F. Properties

XII. Fungicides and nematicides

A. Types

B. Formulations

C. Nature and properties

D. Laws affecting use

XIII. Insecticides

A. Types

B. Formulations

C. Nature and properties

D. Laws affecting use

XIV. Rodenticides and miscellaneous chemicals

A. Types

B. Formulations

C. Nature and properties

D. Laws affecting use

XV. Equipment for chemical application

A. Types

1. Spraying
2. Dusting
3. Fumigators
4. Granular applicators

B. Calibration principles

C. Use and maintenance of equipment

1. Before spraying tips
2. Ground applicator checklist

3. Fumigator checklist
4. Greenhouse operations and applicator checklist
5. After application checklist
6. Cleaning, maintaining, and storing equipment

XVI. Application principles

A. Methods

B. Timing

C. Control of drift

D. Safety

E. Introduction to aerial application

F. Determining formulations

G. Factors affecting application

XVII. Recordkeeping and liability

A. Reasons for keeping records of pesticide use

B. Items of information needed for recordkeeping

C. Common claims brought against applicators and/or growers

1. Drift
2. Crop injury
3. Personal injury
4. Wrong field
5. Bees
6. Attractive nuisance
7. Noise

D. Insurance for pesticide mishaps

1. Types of insurance plans
    a. Bodily injury
    b. Property damage
    c. Restricted chemical liability
    d. Comprehensive chemical
2. Points to consider
    a. Cost
    b. Benefits
    c. Drawbacks

SUGGESTED TEXTS:

North Carolina Agricultural Chemicals Manual. Raleigh, NC: North Carolina Agricultural Extension Service, North Carolina State University, Current Edition.

North Carolina Pesticide Training Manual. Raleigh, NC: North Carolina Agricultural Extension Service, North Carolina State University, Current Edition.

SUGGESTED REFERENCES:

Principles of Pesticide Use, Handling, and Application. Washington, DC: Environmental Protection Agency, Current Edition.

Ware, George G. The Pesticide Book. San Francisco: W. H. Freeman and Company, Current Edition.

CHEMISTRY 101

Chemistry*

DESCRIPTION OF COURSE:

Study of the physical and chemical properties of substances, chemical changes; elements, compounds, gases, chemical combinations; weights and measurements; theory of metals; acids, bases, salts, solvents, solutions and emulsions. In addition, study of carbohydrates; electrochemistry, electrolytes, and electrolysis in their application of chemistry to industry.

COURSE HOURS PER WEEK: Class, 4; Laboratory, 2.

QUARTER HOURS CREDIT: 5

PREREQUISITE: BUS 109.

MAJOR DIVISIONS OF COURSE CONTENT:

I. History and development of chemistry

II. Development of the "scientific approach"

III. Properties of matter

IV. Changes in matter

V. Kinds of matter

VI. Atomic theory

VII. Classification of the elements

VIII. Formulas and equations

IX. Acids

X. Bases

XI. Salts

XII. Solutions

XIII. Introduction to organic chemistry

SUGGESTED TEXTBOOKS:

Dickson, T. R. Introduction to Chemistry. New York: John Wiley and Sons, Inc., Current Edition.

Olmstead, Michael P. Enrichment Experiments in Basic Chemistry. New York: Hayden Book Company, Inc., Current Edition.

Selwood, P. W. General Chemistry. New York: Holt, Rinehart, and Winston, Inc., Current Edition.

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*This is an abstract of the Chemistry syllabus. For a complete copy, write to Program Development Division, Department of Community Colleges, Education Building, Raleigh, NC 27611.

ENGLISH 102

Composition*

DESCRIPTION OF COURSE:

English Composition is designed to aid the student in improvement of self-expression by means of practical application in business and technical writing. Emphasis is on writing sentences, paragraphs, and compositions.

COURSE HOURS PER WEEK: Class, 3; Laboratory, 0.

QUARTER HOURS CREDIT: 3.

PREREQUISITE: ENG 101, Grammar.

MAJOR DIVISIONS OF COURSE CONTENT:

I. Using words

II. Types of sentences

III. Writing sentences

IV. Writing paragraphs

V. Types of writing

VI. Organizing and writing papers

VII. Reading, writing, and learning exposition

SUGGESTED TEXTBOOKS:

Decker, Randall E. Patterns of Exposition. Boston: Little, Brown and Company, Current Edition.

Hall, Donald. Writing Well. Boston: Little, Brown and Company, Current Edition.

Martin, Elizabeth K. and C. Jeriel Howard. Technique: Studies in Composition. San Francisco: Canfield Press, Current Edition.

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*This is an abstract of the English Composition syllabus. For a complete copy, write to Program Development Division, Department of Community Colleges, Education Building, Raleigh, NC 27611.

COURSE OUTLINE

HOR 148 PLANT INSECTS AND DISEASES

Developed By

Horticulture Technology Competency Curriculum Committee

June 1979

PROGRAM DEVELOPMENT
DEPARTMENT OF COMMUNITY COLLEGES
STATE BOARD OF EDUCATION
RALEIGH, NORTH CAROLINA

HORTICULTURE 148

Plant Insects and Diseases

DESCRIPTION OF COURSE:

A study of the detection, identification, and control of insects and diseases that attack plant materials. The nature, structure, and importance of insects is studied. In addition, the structure and life history of various disease organisms are included.

COURSE HOURS PER WEEK: Class, 5; Laboratory, 2.

QUARTER HOURS CREDIT: 6.

PREREQUISITE: AGR 201, Agricultural Chemicals.

COURSE OUTCOMES:

Upon the completion of this course the student should pass with a proficiency determined by the institution, by oral and/or written examinations or other methods, the material contained in the outline of instruction. As a minimum a student should:

(1) Define the terms "entomology," and "plant pathology."

(2) Discuss the economic significance of plant pests.

(3) Identify the internal and external parts of insects.

(4) Illustrate the life cycle of specific insects.

(5) Discuss the senses characteristics of various insects.

(6) List and discuss the beneficial and harmful effects of insects.

(7) Identify the insects that attack the various types of plants.

(8) Determine the methods of control necessary to combat the various types of insects.

(9) List the various causes of plant disease.

(10) Illustrate the life history of specified disease organisms.

(11) Identify the diseases that attack the various types of plants.

(12) Determine the methods of control needed to combat the various types of diseases.

(13) Implement various methods needed to control plant insects and diseases.

(14) Discuss the problems associated with environmental contamination as related to insect and disease control.

OUTLINE OF INSTRUCTION

I. Introduction

   A. Definition of plant pests

   B. Classification of plant pests

   C. Economic significance of plant pests

   D. History of plant pathology and entomology

II. Entomology

   A. Definition and classification of insects

      1. Arthropods and their characteristics
      2. Class Insecta and its characteristics

   B. Insect data

      1. Number of species
      2. Reproductive capacity
      3. Survival capacity
      4. Extremes of size

   C. Insect metamorphosis and anatomy

      1. Metamorphosis
         a. Life cycles
         b. Histories
         c. Simple or gradual
         d. Incomplete
         e. Complete
      2. External anatomy
         a. Head
         b. Thorax
         c. Abdomen
      3. Internal anatomy
         a. Blood system
         b. Nervous system
         c. Breathing system
         d. Digestive system

   D. Senses of insects

      1. Sight
         a. Simple eyes
         b. Compound eyes

2. Hearing
3. Touch
4. Smell
5. Taste

E. Behavior

1. Reflexes and instincts
2. Behavior types
    a. Swarming
    b. Migration
    c. Communities
    d. Societies

F. Beneficial insects

1. Food source
2. Commercial industry
    a. Silk
    b. Shellac
    c. Honey and wax
    d. Dye
3. Medicine
4. Scavengers
5. Pollinators

G. Harmful insects

1. Causes of disease
2. Transmitters of disease
    a. Man
    b. Animals
    c. Plants
3. Annoyances and dangers to people and surroundings
4. Destructive to plants

H. Identification of insects

1. Insects that attack vegetable crops
2. Insects of fruit and fruit trees
3. Insects of forest and shade trees
4. Insects of ornamental plants
5. Insects of grasses

I. Control of insects

1. Methods
    a. Natural
    b. Biological
    c. Cultural
    d. Mechanical and physical
    e. Chemical

      2. Chemical control
         a. Characteristics
            (1) Types
            (2) Nature and properties
            (3) Application
         b. Selection
            (1) Chewing insects
            (2) Sucking insects
            (3) Piercing insects
            (4) Rasping insects

III. Plant pathology

   A. Definition of disease

   B. Causes of disease

      1. Non-living
         a. Environmental
         b. Cultural practices
      2. Living organisms
         a. Fungi
         b. Bacteria
         c. Virus
         d. Insects
      3. Characteristics of disease organisms
         a. Life history
         b. Structure

   C. Identification of plant diseases

      1. Vegetable crops
      2. Fruit and fruit trees
      3. Forest and shade trees
      4. Ornamental plants
      5. Grasses

   D. Control of plant diseases

      1. Methods
         a. Cultural practices
         b. Sanitation
         c. Resistant plants
         d. Chemicals
      2. Implementation of control methods

IV. Special problems of insect and disease control

   A. Pre-harvest and re-entry
   B. Phytotoxicity
   C. Residues
   D. Environmental contamination

SUGGESTED TEXT:

Pirone, Pascal P., and B. O. Dodge, and H. W. Rickett. Diseases and Pests of Ornamental Plants. New York: Ronald Press Company, Current Edition.

SUGGESTED REFERENCES:

Davidson, R. H. and L. M. Peairs. Insect Pests of Farm, Garden, and Orchard. New York: John Wiley & Sons, Inc., Current Edition.

Forsberg, Junius L. Diseases of Ornamental Plants. Urbana, IL: University of Illinois Press, Current Edition.

Johnson, Warren T. and H. H. Lyon. Insects that Feed on Trees and Shrubs in North America: An Illustrated Practical Guide. Ithaca, NJ: Comstock Publishing Associates, Current Edition.

Metcalf, Clell L. Destructive and Useful Insects. New York: McGraw-Hill Book Company, Current Edition.

Neetles, W. C., F. H. Smith, and C. A. Thomas. Insects and Diseases of Ornamentals. Clemson, SC: South Carolina Agricultural Extension Service, Clemson University, Current Edition.

North Carolina Agricultural Chemicals Manual. Raleigh, NC: North Carolina Agricultural Extension Service, North Carolina State University, Current Edition.

North Carolina Pesticide Training Manual. Raleigh, NC: North Carolina Agricultural Extension Service, North Carolina State University, Current Edition.

Shurleff, Malcolm C. How to Control Plant Diseases in Home and Gardens. Ames, IA: Iowa State University Press, Current Edition.

Streets, R. B. The Diagnosis of Plant Diseases. Tucson, AZ: The University of Arizona Press, Current Edition.

Vegetable Insects of North Carolina. Raleigh, NC: North Carolina Agricultural Extension Service, North Carolina State University, Current Edition.

Westcott, Cynthia. The Gardener's Bug Book. New York: Doubleday and Company, Inc., Current Edition.

Wellman, Frederic L. Plant Diseases: An Introduction for the Layman. New York: The National History Press, Current Edition.

COURSE OUTLINE

HOR 151 PLANT MATERIALS I

Developed By

Horticulture Technology Competency Curriculum Committee

June 1979

PROGRAM DEVELOPMENT
DEPARTMENT OF COMMUNITY COLLEGES
STATE BOARD OF EDUCATION
RALEIGH, NORTH CAROLINA

HORTICULTURE 151

Plant Materials I

DESCRIPTION OF COURSE:

This course provides an introduction to the study of ornamental shrubs, annual, biennial and perennial plants, groundcovers and vines that are used for landscape purposes. Students are required to identify each plant by its common and scientific name ~~and~~ describe its major uses in the landscape, and provide information on its cultural requirements.

COURSE HOURS PER WEEK: Class, 2; Laboratory, 4.

QUARTER HOURS CREDIT: 4.

PREREQUISITE: None.

COURSE OUTCOMES:

Upon the completion of this course the student should pass with a proficiency determined by the institution, by oral and/or written examinations or other methods, the material contained in the outline of instruction. As a minimum a student should:

(1) State the purposes of plant identification.

(2) List the common identification keys.

(3) Illustrate the various groupings of plants.

(4) List and discuss the hardiness factors as related to plant adaptability.

(5) Identify, list cultural requirements, and discuss uses of annuals, biennials, and perennials in the landscape design.

(6) Identify, list cultural requirements, and discuss uses of groundcovers in the landscape design.

(7) Identify, list cultural requirements, and discuss uses of vines in the landscape design.

(8) Identify, list cultural requirements, and discuss uses of selected deciduous and evergreen shrubs one to 12 feet tall in the landscape design.

(9) Identify poisonous plants and discuss their effects and restrictions on use in the landscape design.

(10) Use resource materials and plant keys to identify plants and to obtain information concerning cultural requirements and other important data.

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OUTLINE OF INSTRUCTION

I. Introduction

A. Purpose of identification

1. Plant sales
2. Landscape bidding
3. Catalogs
4. Technical literature
5. Plant maintenance
6. Purchasing

B. Keys to identification

1. Leaves
2. Stems
3. Bark
4. Flowers
5. Roots
6. Fruit
7. Buds
8. Odor
9. Seeds

C. Common and scientific names

1. How names are derived
2. Usage
3. Spelling techniques

D. Grouping of plants

1. Physical structure
    a. Herbaceous
    b. Semi-herbaceous
    c. Woody
2. Leaf persistence
    a. Deciduous
        (1) Broad leaves
        (2) Narrow leaves
    b. Evergreen
        (1) Broad leaves
        (2) Narrow leaves

3. Form, habit, size
    a. Vines
    b. Groundcovers
    c. Shrubs
    d. Trees
4. Life-cycle
    a. Annuals
    b. Biennials
    c. Perennials

E. Hardiness as related to plants

1. Hardiness map
2. Hardiness factors
    a. Temperature
    b. Rainfall
    c. Soil
    d. Cultural practices

F. Information record for plants studied

1. Family
2. Genus
3. Common name
4. Native habitat
5. Hardiness
6. Ultimate spread
7. Ultimate height
8. Form and habit
9. Texture
10. Summer and fall color
11. Bark
12. Root system
13. Cultural requirements
    a. Water
    b. Soil
    c. Light
    d. Temperature
    e. Air
14. Exposure
15. Growth rate
16. Season of foliage
    a. Shape
    b. Size
    c. Arrangement
17. Season of flower
    a. Color
    b. Arrangement
    c. General description

18. Season of fruit
    a. Type
    b. Arrangement
    c. Color and size
19. Landscape value and use

G. Plant keys and resource materials

1. Types
2. Usage

II. Plant identification

A. Annuals, biennials, perennials

1. Adaptation
    a. Hardiness
    b. Cultural requirements
2. Information record
3. Uses in landscape design
    a. Gardens
    b. Borders
    c. Rock gardens
    d. Containers

B. Groundcovers

1. Adaptation
    a. Hardiness
    b. Cultural requirements
2. Information record
3. Uses in landscape design
    a. Lawns
    b. Problem areas
    c. Landscape accents
    d. Park and recreation areas

C. Vines

1. Types
    a. Evergreen
    b. Deciduous
2. Adaptation
    a. Hardiness
    b. Cultural requirements
3. Information record
4. Uses in landscape design

D. Shrubs

1. Types
   a. Evergreen
      (1) 1-4 ft.
      (2) 4-6 ft.
      (3) 6-12 ft.
   b. Deciduous
      (1) 1-4 ft.
      (2) 4-6 ft.
      (3) 6-12 ft.
2. Adaptation
   a. Hardiness
   b. Cultural requirements
3. Information record
4. Uses in landscape design

E. Poisonous plants

1. Poisonous parts
2. Effects
3. Restriction on uses

SUGGESTED TEXT:

Halfacre, Gordon. Carolina Landscape Plants. Raleigh, NC: The Sparks Press, Current Edition.

SUGGESTED REFERENCES:

Ashwith, H. and others. The Complete Guide to Garden Flowers. New York: A. S. Barnes, Current Edition.

Bailey, L. H. Manual of Cultivated Plants. New York: Macmillan Company, Current Edition.

Crockett, James U. Annuals. New York: Time-Life Books, Current Edition.

Crockett, James U. Flowering Houseplants. New York: Time-Life Books, Current Edition.

Crockett, James U. Flowering Shrubs. New York: Time-Life Books, Current Edition.

Crockett, James U. Lawns and Groundcovers. New York: Time-Life Books, Current Edition.

Crockett, James U. Perennials. New York: Time-Life Books, Current Edition.

Dirr, Michael. Manual of Woody Landscape Plants. Champaign, IL: Stipes Publishing Co., Current Edition.

Hillier, H. G. Hillier's Manual of Trees and Shrubs. Cranbury, NJ: A. S. Barnes, Current Edition.

Nehrling, Arno and Irene Nehrling. Picture Book of Annuals. Nashville, TN: Hearthside Press, Inc., Current Edition.

Nehrling, Arno and Irene Nehrling. Picture Book of Perennials. Nashville, TN: Hearthside Press, Inc., Current Edition.

Perry, Frances, Editor. Simon and Schuster's Complete Guide to Plants and Flowers. New York: Simon & Schuster, Inc., Current Edition.

Robinson, F. B. Card Index File of Useful Trees and Shrubs. Champaign, IL: The Garrard Press, Current Edition.

The Ball Red Book. West Chicago, IL: George J. Ball, Inc., Current Edition.

Wigginton, Brooks. Trees and Shrubs of the Southeast. Athens, GA: University of Georgia Press, Current Edition.

Wyman, Donald. Ground Cover Plants. New York: Macmillan Company, Current Edition.

Wyman, Donald. Shrubs and Vines for American Gardens. New York: Macmillan Company, Current Edition.

COURSE OUTLINE

AGR 185 SOIL SCIENCE AND FERTILIZERS

Developed By

Horticulture Technology Competency Curriculum Committee

June 1979

PROGRAM DEVELOPMENT
DEPARTMENT OF COMMUNITY COLLEGES
STATE BOARD OF EDUCATION
RALEIGH, NORTH CAROLINA

AGRICULTURE 185

Soil Science and Fertilizers

DESCRIPTION OF COURSE:

A course dealing with the basic principles of efficient classification, evaluation, and management of soils; care, cultivation and fertilization of the soil, and conservation of soil fertility.

COURSE HOURS PER WEEK: Class, 5; Laboratory, 2.

QUARTER HOURS CREDIT: 6.

PREREQUISITE: None.

COURSE OUTCOMES:

Upon the completion of this course the student should pass with a proficiency determined by the institution, by oral and/or written examinations or other methods, the material contained in the outline of instruction. As a minimum a student should:

(1) Define soil.

(2) Discuss the early concepts of soil science and plant growth.

(3) List and provide the functions of the sixteen essential plant food elements according to major, secondary, and trace element designations.

(4) Discuss the factors affecting soil formation.

(5) Draw and label the various parts of a soil profile.

(6) List and discuss the physical, biological, and chemical properties of soils.

(7) Determine the texture and structure of different soils.

(8) Determine the particle density, bulk density, and pore space of different soils.

(9) Take soil samples, submit samples to soil testing laboratory, and interpret results.

(10) Discuss the use of soil survey maps.

(11) List the factors basic to land use classification.

(12) Discuss the characteristics and uses of the eight land capability classes.

(13) Determine the land capability classes of various tracts of land.

(14) Define the three classifications of soil water.

(15) Determine the amount of water in various samples of soils.

(16) Discuss how water is lost from the soil.

(17) Illustrate the pH scale.

(18) Discuss the effects of soil acidity on plant production.

(19) Determine the pH of various soil samples.

(20) List the causes of soil acidity.

(21) Describe how lime reduces soil acidity.

(22) List the types of liming materials.

(23) Apply lime and fertilizer correctly on various types of plants and crops based on soil test reports.

(24) Define fertilizer ratio, grade, and complete fertilizer.

(25) Select proper analysis fertilizers for different plants and crops.

(26) List the various types of materials used to supply nitrogen, phosphorus and potash.

(27) Develop a fertilization program for maintaining plants.

(28) Illustrate the effects of fertilizer injury.

(29) Describe the uses of special fertilizers.

(30) List and discuss the methods for maintaining soil fertility.

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OUTLINE OF INSTRUCTION

I. Introduction

   A. Soil defined

   B. Importance of soil

   C. Uses of soil

II. Soil science and plant growth

    A. Early concepts of soil science and plant growth

    B. Dynamic medium

        1. Soil life
        2. Nutrients supplied to plant rootlets by ion exchange

    C. Essential plant food elements

        1. Sixteen elements
        2. Functions of elements
        3. Soil as a source of plant food elements

    D. Nutrient deficiencies in plants

    E. Mineral toxicity to plants

III. Soil formation and classification

    A. Factors influencing soil formation

        1. Rocks
        2. Minerals
        3. Parent materials
        4. Climate
        5. Plants and organisms
        6. Slope and drainage
        7. Time

    B. Types of soils formed

        1. Zonal
        2. Intrazonal
        3. Azonal

    C. Composition of an average soil

        1. 50% solid matter
        2. 50% pore space

    D. Soil profiles

        1. Profile characteristics
        2. Influence of location upon profiles

    E. Soil properties and their relation to soil formation

        1. Physical properties
            a. Soil separates
            b. Soil texture

        - c. Soil structure
        - d. Soil consistence
        - e. Soil color
        - f. Particle density
        - g. Bulk density
        - h. Pore space
    - 2. Biological properties
        - a. Organisms present in soil
            - (1) Animal
            - (2) Plant
    - 3. Chemical properties
        - a. Colloidal clay
            - (1) Kaolinite
            - (2) Montmorillinite
        - b. Organic soil colloids (humus)
        - c. Cationic exchange
        - d. Soil pH
        - e. Buffer capacity of soils

IV. Soil testing

- A. Purpose of testing soils

- B. Procedure for sampling soils

    - 1. Tools to use
    - 2. Sampling procedures

- C. Soil test procedures

    - 1. State soil testing service
    - 2. Commercial testing service
    - 3. Use of on-site test kits

- D. Interpreting soil test results

V. Classification of soils and land use evaluation

- A. Terminology

    - 1. Soil association and family
        - a. Thickness of topsoil
        - b. Subsoil properties
    - 2. Soil series
        - a. Coastal Plain region
        - b. Piedmont region
        - c. Mountain region

- B. County soil survey maps and reports

    - 1. Aerial photographs
    - 2. Soil survey maps and their use
    - 3. Soil survey reports and their use

C. Factors basic to land use classification

  1. Soil thickness and depth
  2. Soil texture
  3. Soil consistence
  4. Soil structure
  5. Soil permeability
  6. Soil drainage
  7. Slope

D. Land capability classes

  1. Class I land and uses
  2. Class II land and uses
  3. Class III land and uses
  4. Class IV land and uses
  5. Class V through VIII and limitations

VI. Soil water

A. Functions

B. Classification of soil water

  1. Gravitational
  2. Capillary
  3. Hygroscopic

C. Factors influencing water holding capacity of soils

  1. Soil texture
  2. Type of clay
  3. Soil structure
  4. Organic matter

D. Determining soil water

  1. Ovendrying
  2. Tensiometer
  3. Electrical conductivity

E. Water losses from the soil

  1. Surface losses
  2. Gravitational losses
  3. Evaporation losses
  4. Removal by plants

F. Conservation of soil water

1. Terracing
2. Strip cropping
3. Cropping practices
4. Irrigation

VII. Soil acidity and liming

A. The pH scale

B. Effect of soil acidity on plant production

C. Causes of soil acidity

D. Measuring soil acidity

1. Chemical indicators
2. pH meters

E. Nature and function of lime

1. Chemical composition
   a. Agricultural-caleite and dolomitic
   b. Burned lime
   c. Hydrated lime
2. How lime reduces acidity
   a. Clay particles in relation to acidity
   b. Reaction to calcium and magnesium in the soil
   c. Cation-exchange capacity

F. Use of liming materials

1. Selecting materials
   a. Types
   b. Particle size and degree of availability
2. Methods and limitations on applying lime
   a. Common methods of spreading
   b. Applying high rates of lime
   c. Frequency of liming
   d. Effects of adding too much lime
   e. Treating high-lime soils

G. Value or importance of lime

1. Effect upon the condition of the soil
2. Effect upon the availability of plant nutrients
3. Other benefits

VIII. Soil fertility and fertilization

A. Types of fertilizer

1. Organic
2. Inorganic

B. Manufacturing processes

1. Nitrogen materials
2. Phosphorus materials
3. Potash materials
4. Complete fertilizers

C. Fertilizer ratios (analysis)

1. Determination of ratios
2. Selecting analysis for particular plants and crops

D. Application of plant nutrients to meet plant needs

1. Major elements
2. Minor elements
3. Trace elements
4. Placement of fertilizers
   a. Broadcast
   b. Side of row placement
   c. In row placement
   d. Tablets
   e. Liquid
   f. Pot and container placement
5. Requirements for growth
6. Requirements for proper maturity
7. Requirements for high yields
8. Fertilizer injury

E. Special fertilizers

1. All water soluble
2. Liquid-mixed fertilizer
3. Fertilizer-insecticide mixtures
4. Trace element fertilizers
5. Special plant and crop fertilizers

F. Soil fertility maintenance

SUGGESTED TEXT:

Welch, Charles D. and Gerald D. McCart. An Introduction to Soil Science in the Southeast. Chapel Hill; University of North Carolina Press, Current Edition.

SUGGESTED REFERENCES:

Buckman, Harry Oliver, and Nyle C. Brady. The Nature and Properties of Soils. New York: Macmillan Company, Current Edition.

Donahue, Roy Luther. Our Soils and Their Management; An Introduction to Soil and Water Conservation. Danville, IL: The Interstate Printers and Publishers, Inc., Current Edition.

Donahue, Roy Luther. Soils; An Introduction to Soils and Plant Growth. Englewood Cliffs, NJ: Prentice-Hall, Inc., Current Edition.

Foster, Albert Beryl. Approved Practices in Soil Conservation. Danville, The Interstate Printers and Publishers, Inc., Current Edition.

Knuti, Leo Leonard, Milton Korpi, and J. C. Hide. Profitable Soil Management. Englewood Cliffs, NJ: Prentice-Hall, Inc., Current Edition.

Stallings, James Henry. Soil; Use and Improvement. Englewood Cliffs, NJ: Prentice-Hall, Inc., Current Edition.

Teuscher, Henry and R. Adler. The Soil and its Fertility. New York: Reinhold Publishing Corporation, Current Edition.

Vanderford, H. B. Managing Southern Soils. New York: John Wiley and Sons, Inc., Current Edition.

ENGLISH 103

Report Writing*

DESCRIPTION OF COURSE:

The fundamentals of English are utilized as a background for the organization and techniques of report writing. Exercises in developing typical reports, using writing techniques and graphic devices, are completed by the students. Practical application in the preparation of a full-length report is required of each student at the end of the term. The report must relate to the student's specific curriculum.

COURSE HOURS PER WEEK: Class, 3; Laboratory, 0.

QUARTER HOURS CREDIT: 3.

PREREQUISITE: ENG 102, Composition.

MAJOR DIVISIONS OF COURSE CONTENT:

I. Purpose of report writing

II. Types of reports

III. Composition of reports

IV. Organizing and writing reports

V. Editing and proofreading reports

VI. Abstracting reports

SUGGESTED TEXTBOOKS:

Brown, Leland. Effective Business Report Writing. Englewood Cliffs, NJ: Prentice-Hall, Inc., Current Edition.

Harwell, George C. Technical Communications. New York: Macmillan Company, Inc., Current Edition.

Sherman, Theodore A. Modern Technical Writing. Englewood Cliffs, NJ: Prentice-Hall, Inc., Current Edition.

Sklare, Arnold B. The Technician Writes: A Guide to Basic Technical Writing. San Francisco: Boyd and Fraser Publishing Co., Current Edition.

Ulman, Joseph N., Jr. and Jay R. Gould. Technical Reporting. New York: Holt, Rinehart, and Winston, Inc., Current Edition.

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*This is an abstract of the Report Writing syllabus. For a complete copy, write to Program Development Division, Department of Community Colleges, Education Building, Raleigh, NC 27611.

COURSE OUTLINE

HOR 152 PLANT MATERIALS II

Developed By

Horticulture Technology Competency Curriculum Committee

June 1979

PROGRAM DEVELOPMENT
DEPARTMENT OF COMMUNITY COLLEGES
STATE BOARD OF EDUCATION
RALEIGH, NORTH CAROLINA

HORTICULTURE 152

Plant Materials II

DESCRIPTION OF COURSE:

A study of selected evergreen and deciduous trees including large shrubs which are often considered small trees that are designed for landscape purposes. Identification, cultural requirements, and uses of selected trees and large shrubs will be covered.

COURSE HOURS PER WEEK: Class, 2; Laboratory, 4.

QUARTER HOURS CREDIT: 4.

PREREQUISITE: HOR 151, Plant Materials I.

COURSE OUTCOMES:

Upon the completion of this course the student should pass with a proficiency determined by the institution, by oral and/or written examinations or other methods, the material contained in the outline of instruction. As a minimum a student should:

(1) State the purposes of identifying trees and large shrubs.

(2) List the purposes of knowing the characteristics, cultural requirements, and uses of large shrubs and trees in the landscape.

(3) List the common identification keys.

(4) List and discuss the hardiness factors as related to large shrub and tree adaptability.

(5) Effectively use resource materials and plant keys to identify large shrubs and trees and to obtain information concerning cultural requirements and other important data.

(6) Identify, list cultural requirements, and discuss uses of large shrubs in the landscape design.

(7) Identify, list cultural requirements, and discuss uses of small evergreen trees in the landscape design.

(8) Identify, list cultural requirements, and discuss uses of small deciduous trees in the landscape design.

(9) Identify, list cultural requirements, and discuss uses of large evergreen trees in the landscape design.

(10) Identify, list cultural requirements, and discuss uses of large deciduous trees in the landscape design.

(11) Name trees suitable for special plantings for containers, street planting, windbreaks and problem areas and situations.

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OUTLINE OF INSTRUCTION

I. Introduction

   A. Purpose of identifying trees and large shrubs

   B. Purpose of knowing characteristics, cultural requirements, and uses in the landscape

   C. Keys to identification

      1. Leaves
      2. Stems
      3. Bark
      4. Flowers
      5. Roots
      6. Fruit
      7. Buds
      8. Odor
      9. Seeds

   D. Common and scientific names

      1. How names are derived
      2. Usage
      3. Spelling techniques

   E. Hardiness

      1. Hardiness map
      2. Hardiness factors
         a. Temperature
         b. Rainfall
         c. Soil
         d. Cultural practices

   F. Plant keys and resource materials

      1. Types
      2. Usage

II. Identification

A. Large shrubs

1. Types
   a. Evergreen
   b. Deciduous
2. Common and scientific name
3. Identification characteristics
4. Cultural requirements
5. Use in landscape
6. Features
   a. Size
   b. Form
   c. Texture
   d. Color
      (1) Foliage
      (2) Flower
      (3) Fruit
7. Hardiness
8. Varieties

B. Small evergreen trees

1. Common and scientific name
2. Identification characteristics
3. Cultural requirements
4. Use in landscape
5. Features
   a. Size
   b. Form
   c. Texture
   d. Color
      (1) Foliage
      (2) Flower
      (3) Fruit
6. Hardiness
7. Varieties

C. Small deciduous trees

1. Common and scientific name
2. Identification characteristics
3. Cultural requirements
4. Use in landscape
5. Features
   a. Size
   b. Form
   c. Texture
   d. Color
      (1) Foliage
      (2) Flower
      (3) Fruit

    6. Hardiness
    7. Varieties

  D. Large evergreen trees

    1. Common and scientific name
    2. Identification characteristics
    3. Cultural requirements
    4. Use in landscape
    5. Features
        a. Size
        b. Form
        c. Texture
        d. Color
            (1) Foliage
            (2) Flower
            (3) Fruit
    6. Hardiness
    7. Varieties

  E. Large deciduous trees

    1. Common and scientific name
    2. Identification characteristics
    3. Cultural requirements
    4. Use in landscape
    5. Features
        a. Size
        b. Form
        c. Texture
        d. Color
            (1) Foliage
            (2) Flower
            (3) Fruit
    6. Hardiness
    7. Varieties

III. Trees suitable for special plantings

  A. Containers

  B. Street planting

  C. Windbreaks

  D. Problem areas and situations

SUGGESTED TEXTS:

Wigginton, Brooks E. Trees and Shrubs for the Southeast. Athens, Georgia: University of Georgia Press, Current Edition.

Wyman, Donald. *Trees for American Gardens*. New York: The Macmillan Company, Current Edition.

SUGGESTED REFERENCES:

Brockman, Frank, Herbert Zim, and George Fichter. *Trees of North America*. Racine, WI: Western Publishing Company, Current Edition.

Harrar, Elwood S. and George J. Harrar. *Guide to Southern Trees*. New York: Dover Publishers, Current Edition.

Hillier, H. G. *Hillier's Manual of Trees and Shrubs*. Cranbury, NJ: A. S. Barnes, Current Edition.

Robinson, F. B. *Card Index File of Useful Trees and Shrubs*. Champaign, IL: The Garrard Press, Current Edition.

Symonds, George W. *The Tree Identification Book*. West Caldwell, NJ: William Morrow and Company, Inc., Current Edition.

Taylor, Norman. *The Guide to Garden Shrubs and Trees*. Boston, MA: Houghton-Mifflin Co., Current Edition.

COURSE OUTLINE

HOR 224 LANDSCAPE MAINTENANCE

Developed By

Horticulture Technology Competency Curriculum Committee

June 1979

PROGRAM DEVELOPMENT
DEPARTMENT OF COMMUNITY COLLEGES
STATE BOARD OF EDUCATION
RALEIGH, NORTH CAROLINA

HORTICULTURE 224

Landscape Maintenance

DESCRIPTION OF COURSE:

The principles and techniques of maintaining lawns, shrubs, trees, flowers, bulbs, and other plantings. Included is fertilization, disease control, pruning, irrigation, and proper use of various herbicides and insecticides.

COURSE HOURS PER WEEK: Class, 2; Laboratory, 4.

QUARTER HOURS CREDIT: 4

PREREQUISITES: AGR 185, Soil Science & Fertilizers.
AGR 201, Agricultural Chemicals.
HOR 151, Plant Materials I.

COURSE OUTCOMES:

Upon the completion of this course the student should pass with a proficiency determined by the institution, by oral and/or written examinations or other methods, the material contained in the outline of instruction. As a minimum a student should:

(1) Clean grounds of leaves and litter.

(2) Clean drainage ditches, culverts, and gutters.

(3) Water flower beds, lawns, trees, and shrubbery.

(4) Discuss the requirements for maintaining bulbs and selected plants.

(5) Mow and trim lawns.
  . Aerate lawns
  . Remove thatch from lawns.

(6) Cultivate flower beds.

(7) Select and use mulches.

(8) Fell trees and remove brush and other unwanted shrubs and plants from area.

(9) Transplant trees and/or shrubs.

(10) Identify and properly use pruning tools and equipment.

(11) Prune and remove dead or unwanted plant branches.

(12) Prune and trim trees and shrubs at the correct time using proper equipment and methods.

(13) Scrape plant wounds.

(14) Apply protective substances to tree wounds, cut surfaces, and disease infestations.

(15) Identify weeds, pests, and diseases.

(16) Determine methods of control needed to eradicate weeds, pests, and diseases.

(17) Apply appropriate control measures by calibrating and using appropriate equipment correctly.

(18) Follow all safety precautions when administering control measures.

(19) List and discuss the factors affecting control measures.

(20) Prepare lawn for reseeding.

(21) Reseed, sod, or sprig a lawn.

(22) Repair worn spots in lawn with sod or reseeding.

(23) Apply lime and fertilizer according to soil test results.

(24) Repair walkways, driveways, and patios.

(25) Estimate costs of completing landscape maintenance projects.

(26) Develop maintenance schedules for landscape maintenance projects.

(27) Maintain small engines used in landscape maintenance projects.

(28) Stake and guy trees and shrubs.

(29) List the various components of an irrigation system and discuss their working relationships.

(30) Set up and operate various types of irrigation systems including automatic and semi-automatic.

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OUTLINE OF INSTRUCTION

I. Introduction

   A. Definition of maintenance

   B. Need

   C. Employment opportunities

II. Lawn maintenance and renovation

   A. Removal of leaves and litter

      1. Need for removal
      2. Use of tools and equipment
         a. Vacuum
         b. Blowers
         c. Hand tools

   B. Mow and trim lawns

      1. Grass types
         a. Warm season
         b. Cool season
      2. Recommended heights for cutting different grasses
      3. Operation and adjustment of equipment
         a. Hand mowers
         b. Power mowers
         c. Trimmers
         d. Edgers
      4. Mowing and edging procedures

   C. Repair worn or damaged spots in lawn

      1. Lawn reseeding
         a. Identification of grass used in lawn
         b. Seedbed preparation
            (1) Adjustment and operation of tools and equipment
            (2) Raking and leveling area
         c. Seeding
            (1) Methods
            (2) Procedures
         d. Mulching
            (1) Types of mulch
            (2) Procedures
         e. Water reseeded lawn
      2. Lawn re-sodding
         a. Identification of grass used in lawn
         b. Bed preparation
         c. Re-sodding procedures
         d. Watering

3. Lawn re-sprigging
    a. Identification of grass used in lawn
    b. Bed preparation
    c. Re-sprigging procedures
    d. Watering

D. Lime and fertilizer application

1. Lime and fertilizer recommendations for different type grasses
2. Time of application
3. Soil testing
    a. Procedures
    b. Interpreting results
4. Application of lime and fertilizer based on soil test results
    a. Equipment
        (1) Calibration
        (2) Operating procedures
        (3) Safety
    b. Procedures

E. Weed and pest treatment and control

1. Identification
    a. Weeds
    b. Pests
        (1) Insects
        (2) Rabbits
        (3) Moles
        (4) Mice
        (5) Nematodes
2. Damage
3. Methods of control
    a. Mechanical
    b. Biological
    c. Cultural
    d. Chemical
4. Factors affecting control measures
5. Calibration and operation of equipment
6. Safety

F. Disease control

1. Identification of diseases
2. Damage
3. Methods of control
4. Factors affecting control measures
5. Calibration and operation of equipment
6. Safety

G. Poisonous plants

  1. Identification
  2. Methods of removal
     a. Hand tools
     b. Cultural practices
     c. Herbicides
        (1) Types
        (2) Methods of application
        (3) Calibration of equipment
        (4) Equipment operation
        (5) Safety

H. Watering lawns

  1. Factors
     a. Moisture of soil
     b. Water requirements of different grasses
     c. Timing
     d. Soil drainage
  2. Equipment
     a. Hoses
     b. Soakers
     c. Handwand
     d. Automatic and semi-automatic irrigation equipment
     e. Equipment use and operation
  3. Measuring amount of water applied

I. Other maintenance activities

  1. Aerate
  2. Remove thatch

III. Maintaining shrubbery and trees

A. Remove leaves and litter from shrubbery
  1. Need for removal
  2. Use of tools and equipment

B. Lime and fertilizer application

  1. Lime and fertilizer recommendations for different type plants
  2. Time of application
  3. Soil testing
     a. Procedures
     b. Interpreting results
  4. Application of lime and fertilizers
     a. Types of materials
     b. Calculating amounts based on recommendations of soil test results
     c. Methods of application
     d. Procedures for method(s) selected

C. Weed and pest treatment and control

1. Identification
   a. Weeds
   b. Pests
      (1) Insects
      (2) Rabbits
      (3) Moles
      (4) Mice
      (5) Nematodes
      (6) Deer
2. Damage
3. Methods of control
   a. Mechanical
   b. Biological
   c. Cultural
   d. Chemical
4. Factors affecting control measures
5. Calibration and operation of equipment
6. Safety

D. Disease control

1. Identification of diseases
2. Damage
3. Methods of control
4. Factors affecting control measures
5. Calibration and operation of equipment
6. Safety

E. Pruning

1. Objectives or reasons for pruning
2. Plant structure as related to pruning
   a. Roots
   b. Stem or trunk
   c. Branches
   d. Spurs
   e. Shoots
   f. Leaves, flowers, and fruit
   g. Types of buds
3. Pruning equipment (characteristics and use)
   a. Hand shears
   b. Lopers
   c. Saws
   d. Axes
   e. Knives
   f. Ladders
   g. Safety ropes
   h. Safety saddles

4. Timing
   a. Herbaceous plants
   b. Woody plants
      (1) Deciduous
      (2) Evergreen
   c. Factors
      (1) Food supply
      (2) Flowering period
      (3) Plant hardiness
      (4) Plant dormancy
   d. Methods of pruning
      (1) Characteristics
      (2) Procedures
5. Application of protective substances on cut surfaces

F. Scrape and shape plant wounds

1. Purposes
2. Timing
3. Tools and equipment
   a. Identification
   b. Proper use
4. Procedures
5. Protective substances
   a. Reasons for coating wounds
   b. Types and characteristics of protective substances
   c. Application procedures

G. Watering shrubbery and trees

1. Factors
   a. Moisture of soil
   b. Water requirements
   c. Timing
   d. Soil drainage
   e. Mulches
2. Equipment
   a. Hoses
   b. Soakers
   c. Handwand
   d. Automatic and semi-automatic irrigation equipment
   e. Equipment use and operation
3. Measuring amount of water applied

H. Transplanting trees and/or shrubs

1. Digging trees and/or shrubs
   a. Equipment
   b. Procedures
2. Digging holes for plant setting
   a. Tools and equipment
   b. Procedures

3. Placing plants in holes
    a. Procedures
    b. Backfilling
4. Watering plants
5. Mulching
    a. Types and characteristics
    b. Procedures

I. Felling unwanted trees

1. Marking dead or unwanted trees
    a. Materials
    b. Procedures
2. Tools and equipment - characteristics
    a. Types
    b. Operation
    c. Safety
3. Factors in determining direction of fall of trees
4. Felling trees
    a. Use of tools and equipment
    b. Procedures

J. Cleaning brush and unwanted plants

1. Removing brush
    a. Tools
        (1) Axes
        (2) Hand saws
        (3) Power saws
    b. Equipment
        (1) Bulldozer or tractor with front-end loader
        (2) Trucks
    c. Procedures
2. Removing unwanted plants
    a. Methods
        (1) Digging
        (2) Sawing
        (3) Pushing or pulling out
    b. Tools and equipment
        (1) Types
        (2) Use and operation
        (3) Safety

IV. General maintenance

A. Cleaning drainage ditches, culverts, and gutters

1. Tools and equipment
    a. Uses
    b. Operation
2. Procedures

B. Cultivating flower beds

  1. Benefits
  2. Methods
     a. Tools
     b. Procedures

C. Selecting and using mulches

  1. Types and characteristics
  2. Benefits
  3. Application procedures

D. Repairing walkways, driveways, and patios

  1. Materials
  2. Use and operation of tools and equipment
  3. Procedures

E. Staking and guying trees and shrubs

  1. Tools and materials
  2. Procedures

F. Maintaining small engines

  1. Engine types
  2. Operating procedures
  3. Recommended maintenance schedules
  4. Maintenance procedures

V. Estimating landscape maintenance jobs

A. Costs

  1. Materials
  2. Labor
  3. Overhead

B. Ratio of costs to profit

C. Cost summation

D. Final estimate

SUGGESTED TEXTS:

Christopher, Everett P. The Pruning Manual. Riverside, NJ: Macmillan Company, Current Edition.

Hoover, Norman K. Approved Practices in Beautifying the Home Grounds. Danville, IL: Interstate Printers and Publishers, Inc., Current Edition.

SUGGESTED REFERENCES:

Carpenter, Phillip L. Plants in the Landscape. San Francisco: W. H. Freeman & Company, Current Edition.

Conover, H. S. Grounds Maintenance Handbook. New York: McGraw-Hill Book Company, Inc., Current Edition.

Controlling Lawn Grass Diseases. Raleigh, NC: North Carolina Agricultural Extension Service, North Carolina State University, Current Edition.

Couch, H. B., and W. W. Osborne. Chemical Control of Turfgrass Diseases. Blacksburg, VA: Cooperative Extension Service, Virginia Polytechnic Institute, Current Edition.

Frederiksen, Stan, and W. A. Small. Turf Pest Management Handbook. St. Louis, MO: Mallinckrodt Chemical Works, Current Edition.

Harris, John H., and R. Gordon Halfacre. Keep 'Em Growing. Raleigh, NC: Litho Industries, Inc., Current Edition.

Israelson, Orson W. and Vaughn Hensen. Irrigation Principles and Practices. New York: John Wiley and Sons, Inc., Current Edition.

Murphy, Richard and William Meyer. Care and Feeding of Trees. New York: Crown Publishing Company, Current Edition.

N. C. Agriculture Chemicals Handbook. Raleigh, NC: North Carolina Agricultural Extension Service, North Carolina State University, Current Edition.

N. C. Pesticide Training Manual. Raleigh, NC: North Carolina Agricultural Extension Service, North Carolina State University, Current Edition.

Pirone, P. P. Tree Maintenance. Fairlawn, NJ: Oxford University Press, Current Edition.

Thompson, W. T. Tree, Turf, and Ornamental Pesticide Guide. Fresno, CA: Thompson Publishing Company, Current Edition.

COURSE OUTLINE

HOR 251 LANDSCAPE PLANNING I

Developed By

Horticulture Technology Competency Curriculum Committee

June 1979

PROGRAM DEVELOPMENT
DEPARTMENT OF COMMUNITY COLLEGES
STATE BOARD OF EDUCATION
RALEIGH, NORTH CAROLINA

HORTICULTURE 251

Landscape Planning I

DESCRIPTION OF COURSE:

An introduction to blueprint reading and an introductory study of the basic principles of landscape design. The course is oriented toward an understanding of basic principles fundamental to all landscape design endeavors. However, emphasis is placed upon students developing residential site plans.

COURSE HOURS PER WEEK: Class, 2; Laboratory, 4.

QUARTER HOURS CREDIT: 4

PREREQUISITE: HOR 135, Landscape Drafting

COURSE OUTCOMES:

Upon the completion of this course the student should pass with a proficiency determined by the institution, by oral and/or written examinations or other methods, the material contained in the outline of instruction. As a minimum a student should:

(1) List the purposes of blueprints.

(2) Discuss the uses of blueprints in the landscaping industry.

(3) Identify dimension lines and extension lines.

(4) List and define the types of pictorial drawings.

(5) Define working drawings.

(6) List and discuss the parts of working drawings.

(7) Identify uses of working drawings.

(8) Read and interpret a simple working drawing.

(9) Briefly discuss the history of landscape design.

(10) Define the following terms: order, unity, balance, accent, repetition, rhythm, and sequence.

(11) List and discuss the types of landscape design plans.

(12) List and define the parts of a landscape plan.

(13) Analyze a residential landscape site.

(14) Measure lot size or area to be landscaped as well as determine building measurements.

(15) Draw examples of foundation plantings.

(16) List and discuss the three areas of residential landscape plans.

(17) Draw simple residential landscape plans.

OUTLINE OF INSTRUCTION

I. Introduction to blueprint reading

A. Drawing as a universal language

1. The graphic language
    a. Lines
    b. Symbols
    c. Conventions
    d. Abbreviations
2. Types of prints and processes
3. Application in the building and landscaping trades

B. Purposes of blueprints

1. Represent tree shape
2. Represent exact size
3. Give directions for various phases of construction

C. Specifications

1. Relationship to drawings
2. Legal document

D. Multiple view drawings

1. Visualization from blueprints
2. Planes of projection, location, and arrangement
    a. Front
    b. Top
    c. Sides
    d. Back
3. Sketching problems of multiple views

E. Understanding various views in blueprint reading or drawing

1. Visualizing the object
2. Analyzing the object
3. Seeing the relationship of the part to the whole

II. Representation of dimensions and finish

- A. Size description
    1. Importance
    2. Size dimensions
- B. Location of dimensions
- C. Notes and information on dimensions and installation instructions
- D. Placement of dimensions and installation instructions on blueprints
    1. Types of lines and parts showing size
        - a. Extension lines
        - b. Dimension lines
        - c. Arrowheads
        - d. Dimensioning numerals
    2. Symbols and placement
- E. Measuring in reading a blueprint
    1. Scale drawing using architect's scale
    2. Accuracy in measurements
    3. Problems in scaling of drawings
- F. Dimensioning procedures
    1. Rules and placement of dimensions
        - a. Views of an object and relationship of one to another
        - b. Circles
        - c. Arcs of circles, angles
        - d. Location dimensions
        - e. Notes and special information
    2. Dimensioning practice

III. Pictorial drawing

- A. Types of pictorial drawings
    1. Isometric
    2. Oblique
    3. Cabinet
- B. Practical applications
- C. Sketching problems
    1. Isometric dimensions
    2. Oblique drawing and sketching
    3. Cabinet drawing

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IV. Working drawings: procedure and techniques

   A. Definition and symbology of working drawings

      1. Detailed and plan drawings
      2. Parts of the working drawing
         a. Views
         b. Dimensions
         c. Notes and symbols

   B. Use of working drawings

      1. Purpose of working drawings and plans
      2. Types of working drawings in construction and landscaping
      3. Information given by notes and symbols
         a. Bills of material
         b. Title
         c. Construction or installation information
         d. Material symbols
         e. Scale

V. Introduction to landscape design

   A. Art of landscape architecture

   B. History of landscape design

      1. Gardening in Italy, the Renaissance
      2. Gardening in France, 1200-1500
      3. Gardening in America

   C. Importance of landscape design

      1. Aesthetics
      2. Functional value
      3. Monetary value

VI. Theory of landscape design

   A. Division of property into related components

   B. The forms of order, unity, and balance

   C. Accent

   D. Proportion and scale

   E. Repetition, rhythm, and sequence

VII. Horticulture in landscape design

   A. Plant selection

   B. Plant indicators

VIII. Principles of landscape composition

A. General considerations

1. Appropriateness of material
2. Choice of plants for space
3. Year-round interest
4. Choice of plants for style of architecture
5. Proper grouping of plants

B. Physical characteristics of plants

1. Form
2. Texture
3. Light and shade
4. Color
5. Foliage
6. Flower and fruiting habits

C. Cultural factors

1. Plant hardiness
2. Water requirements
3. Soil requirements
4. Light tolerance
5. Wind tolerance
6. Susceptibility to insects and plant diseases

IX. Types of landscape design plans

A. General plan

B. Grading plan

C. Staking and drainage plan

D. Construction plan

E. Planting plan

F. Sprinkler plan

G. Contracts, bid forms, and specifications

X. Parts of landscape plans

A. Plant symbols

B. Architectural features

C. Lettering

D. Title block

E. Borders

XI. Residential landscaping

A. Factors

1. The lot and its characteristics
2. Neighborhood sights and noises
3. Needs of the homeowner
4. Time, effort, and money to spend on maintenance

B. Designing the residential landscape

1. Analyzing the site
    a. Lay of the land
    b. Grading
    c. Structures
    d. Drainage
    e. Existing vegetation
    f. Soil characteristics
    g. Natural features
    h. Climate
2. Taking and using measurements
    a. Lot size or area to be landscaped
    b. Building measurements
    c. Walks, driveways, and other special use areas
3. Drawing the plan
    a. Foundation plantings
        (1) Doors
        (2) Corners
        (3) Under windows
        (4) Blank wall spaces
        (5) Porches
        (6) Patios
        (7) Other
    b. Transport structures
        (1) Driveways
        (2) Walks
        (3) Steps
    c. Private area
        (1) Screening
        (2) Recreation area
        (3) Flower beds
    d. Public area
        (1) Foundation plantings
        (2) Circulation structures (walks, drives, and steps)
        (3) Tree and shrubbery plantings
        (4) Lawn areas
        (5) Screening off unpleasant views

    - (6) Basic landscaping styles
        - (a) Curved lines
        - (b) Straight lines
        - (c) Arc and tangent
- e. Living or service area
    - (1) Screening
    - (2) Space
- f. Structures in the landscape
    - (1) Retaining walls and raised beds
    - (2) Drains and catch basins
    - (3) Fences, lattices, and arbors

SUGGESTED TEXTS:

Kramer, Jack. *Gardening and Home Landscaping*. New York: Harper and Row Publishers, Inc., Current Edition.

Nelson, William R., Jr. *Landscaping Your Home*. Champaign, IL: University of Illinois at Urbana, Cooperative Extension Service, Current Edition.

SUGGESTED REFERENCES:

Bellis, Herber and Walter A. Schmidt. *Blueprint Reading for the Construction Trade*. New York: McGraw-Hill Book Company, Inc., Current Edition.

Eckbo, Garrett. *The Art of Home Landscaping*. New York: F. W. Dodge Corporation, Current Edition.

Giesecke, Frederick E., Alva Mitchell, and Henry Cecil Spencer. *Technical Drawing*. New York: Macmillan Company, Current Edition.

Halfacre, R. Gordon and Anne Rogers Shawcroft. *Carolina Landscape Plants*. Raleigh, NC: The Sparks Press, Current Edition.

Hoover, Norman K. *Approved Practices in Beautifying the Home Grounds*. Danville, IL: The Interstate Printers and Publishers, Inc., Current Edition.

Hornung, William J. *Blueprint Reading*. Englewood Cliffs, NJ: Prentice-Hall, Inc., Current Edition.

Raymore, Henry B. and H. Stuart Ortloff. *The Book of Landscape Design*. Caldwell, NJ: William Morrow and Company, Current Edition.

Robinette, Gary O. *Off the Board - into the Ground*. Iowa: Kendall/Hunt Publishing Company, Current Edition.

COURSE OUTLINE

HOR 259 GARDEN CENTER OPERATION

Developed By

Horticulture Technology Competency Curriculum Committee

June 1979

PROGRAM DEVELOPMENT
DEPARTMENT OF COMMUNITY COLLEGES
STATE BOARD OF EDUCATION
RALEIGH, NORTH CAROLINA

HORTICULTURE 259

Garden Center Operation

DESCRIPTION OF COURSE:

A course covering all phases of garden center operation including some of the major problems. Areas of study in the course include layout, stocking, product knowledge, traffic flow, seasonal fluctuations, risks, diversification and merchandising. Ample time will be devoted to visitations to established garden center operations.

COURSE HOURS PER WEEK: Class, 2; Laboratory, 2.

QUARTER HOURS CREDIT: 3.

PREREQUISITE: BUS 109, Business Mathematics.

COURSE OUTCOMES:

Upon the completion of this course the student should pass with a proficiency determined by the institution, by oral and/or written examinations or other methods, the material contained in the outline of instruction. As a minimum a student should:

(1) Define marketing.

(2) Discuss the role of marketing in society.

(3) Discuss the difference between retail and wholesale marketing of horticulture products.

(4) List the procedures used in defining a market area.

(5) Identify products and plants that are sold in garden centers.

(6) Develop advertising for use on radio, television, newspapers, and sales leaflets.

(7) Use supplier advertising materials effectively to supplement self-produced ads.

(8) Identify customer needs and wants.

(9) Describe to customers the purposes, qualities, and other needed information of merchandise for sale.

(10) Take orders for sales or service by telephone.

(11) Quote cost of plants.

(12) Make cost estimates on customer orders.

(13) Use effective interpersonal relationships in dealing with customers.

(14) Label and price mark merchandise.

(15) Display store merchandise for sale.

(16) Wrap and/or package merchandise sold.

(17) Deliver or ship merchandise sold.

(18) Rent equipment to customers.

(19) Write up customer orders.

(20) Use cash register, adding machine, calculator, and other recording devices.

(21) Answer customer complaints.

(22) Follow up sales to determine customer satisfaction.

(23) Develop and verify customer directories.

(24) Prepare and keep current price lists and sales catalogs.

(25) Water and properly care for plants on display and/or storage.

(26) Repair or reball balled and burlapped plants.

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OUTLINE OF INSTRUCTION

I. Introduction

A. Principles of marketing

1. Definition of marketing
2. Role of marketing in society
3. Relation of marketing principles to horticultural products
4. Finding and using marketing reports and related material
5. Market analysis

B. Marketing of horticultural products

1. Retail
2. Wholesale

II. Relating marketing practices to horticultural products

- A. Defining market area
  1. Geographical location
  2. Marketing trends
  3. Population trends and income levels
  4. Customer needs and desires
  5. Characteristics of customers
- B. Advertising
  1. Choosing the proper media
     - a. Radio
     - b. Television
     - c. Newspapers
     - d. Handouts, flyers, billboards, etc.
  2. Composition of ads
     - a. Truthfulness
     - b. Socially responsible
     - c. Informative
     - d. Ethical
     - e. Educational
     - f. Sells the product
- C. Product displays
  1. Seasonal items
  2. Standard sellers
  3. Related products close to main items
  4. Impulse items
  5. Special displays
  6. Labeling
  7. Product information
  8. Traffic flow

III. Customer relationships

- A. Greeting customers
- B. Determining customer needs
- C. Providing product knowledge to customers
  1. Identification of plants and products
  2. Cost
  3. Fertilization requirements of plants
  4. Disease control of plants
  5. Insect control of plants
  6. Guarantees
  7. Other characteristics and features

D. Customer complaints

   1. Courteous manner
   2. Prompt follow-up

IV. Employee responsibilities

A. Telephone etiquette

B. Customer orders

   1. Materials costs
   2. Installation costs (if applicable)
   3. Markup

C. Labeling and price marking merchandise

D. Making sales and recording transactions

   1. Proper use of machines
   2. Procedures for making cash and charge transactions

E. Wrapping and packaging products sold

F. Delivering or shipping merchandise sold

   1. Information needed
   2. Proper wrapping and packing
   3. Delivery

G. Renting equipment

   1. Demonstrate use
   2. Provide relevant information
   3. Complete forms

H. Watering and properly caring for plants on display and/or storage

I. Repairing and reballing balled and burlapped plants

J. Handling plants and other merchandise correctly

K. Storing received merchandise

V. Directories

A. Customer

   1. Development
   2. Verifying

- B. Sales lists or catalogs
    - 1. Development
    - 2. Distribution

VI. Customer satisfaction

- A. Follow up surveys
    - 1. Telephone
    - 2. Mail
    - 3. Personal interview
- B. Data complication
- C. Use of data

SUGGESTED TEXT:

Pinney, John J. Operating a Garden Center. New York: Rosen, Richards, Press, Inc., Current Edition.

SUGGESTED REFERENCES:

Berninger, Louis M. Profitable Garden Center Management. Englewood Cliffs, NJ: Reston Publishing Company, Current Edition.

Kohls, Richard and David Downey. Marketing of Agricultural Products. Riverside, NJ: Macmillan Company, Current Edition.

ENGLISH 204

Oral Communication*

DESCRIPTION OF COURSE:

The principles, techniques and practical applications of communicating the thoughts and personality through the voice and visible action of the individual to one or more persons for the purpose of achieving a previously determined response. Areas covered vary according to class needs, but, in general, include: basic concepts, nonverbal and verbal language, vocal usage, speech preparation (analyzing audience and occasion, determining purpose, selecting and narrowing subject, gathering and organizing material, wording and practicing aloud), and effective listening.

COURSE HOURS PER WEEK: Class, 3; Laboratory, 0.

QUARTER HOURS CREDIT: 3

PREREQUISITE: None.

MAJOR DIVISIONS OF COURSE CONTENT:

I. Basic concepts of communication

II. Using the body to communicate

III. Using the voice to communicate

IV. Preparing the speech

V. Effective listening

SUGGESTED TEXTBOOKS:

Hasling, John. The Message, the Speaker, the Audience. New York: McGraw-Hill Book Company, Current Edition.

Monroe, Alan H. Principles of Speech Communication. Glenview, IL: Scott, Foresman and Company, Current Edition.

Ross, S. Raymond. Speech Communication: Fundamentals and Practice Englewood Cliffs, NJ: Prentice-Hall, Inc., Current Edition.

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*This is an abstract of the Oral Communication syllabus. For a complete copy, write to Program Development Division, Department of Community Colleges, Education Building, Raleigh, NC 27611.

COURSE OUTLINE

HOR 256 NURSERY MANAGEMENT I

Developed By

Horticulture Technology Competency Curriculum Committee

June 1979

PROGRAM DEVELOPMENT
DEPARTMENT OF COMMUNITY COLLEGES
STATE BOARD OF EDUCATION
RALEIGH, NORTH CAROLINA

HORTICULTURE 256

Nursery Management I

DESCRIPTION OF COURSE:

The production of field grown nursery stock is emphasized in this course. In addition, management practices and techniques including areas such as cost finding, price establishing, recordkeeping, planning of nursery layout of facilities, and personnel management are included.

COURSE HOURS PER WEEK: Class, 2; Laboratory, 4.

QUARTER HOURS CREDIT: 4

PREREQUISITES: HOR 144, Plant Propagation.
HOR 148, Plant Insects & Diseases
AGR 185, Soil Science & Fertilizers
AGR 201, Agricultural Chemicals

COURSE OUTCOMES:

Upon the completion of this course the student should pass with a proficiency determined by the institution, by oral and/or written examinations or other methods, the material contained in the outline of instruction. As a minimum a student should:

(1) Take soil samples and interpret results.

(2) Calibrate spreaders and apply fertilizer and lime according to soil test data.

(3) Plow, disk, level, and lay off rows for planting.

(4) Lay off and install drainage system.

(5) Install and operate irrigation system.

(6) Plant various species of plants.

(7) Cultivate plants.

(8) Develop fertilization program for maintaining plants.

(9) Properly fertilize plants.

(10) Prune plants at proper time using appropriate methods.

(11) Identify weeds, pests, and diseases.

(12) Determine methods of control needed to eradicate weeds, pests, and diseases.

(13) Apply appropriate control measures.

(14) Discuss factors affecting control measures.

(15) Follow all safety factors when administering control measures.

(16) Remove dead or undesirable stock.

(17) Dig plants by machine or by hand (ball and burlapped).

(18) Identify labor needs.

(19) Determine types and amount of equipment to buy and stock.

(20) Identify and select producers and suppliers of plants, equipment, supplies, etc.

(21) Select and purchase equipment, supplies, etc.

(22) Enforce safety regulations.

(23) Recruit and select employees.

(24) Train employees.

(25) Designate employee work assignments.

(26) Supervise employees.

(27) Evaluate employee performance.

(28) Perform personnel actions such as promoting, firing, disciplinary actions.

(29) Establish employee wages, hours, and working conditions.

(30) Analyze new products and plants to determine if they need to be added to the sales line.

(31) Analyze current market trends and expansion possibilities.

(32) Determine business credit needs.

(33) Locate sources of and secure credit.

(34) Prepare, negotiate, and implement sales contracts.

(35) Identify various professional and trade associations and make decisions about membership in these organizations.

(36) Identify sources of current information on plant diseases, insects, new plants and varieties, equipment, etc.

(37) Identify the various professional and trade publications in horticulture.

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OUTLINE OF INSTRUCTION

I. Introduction

  A. Container grown versus field grown production

  B. Factors affecting choice of production

    1. Amount of land and land values
    2. Grower's preference
    3. Stock to be grown
    4. Facilities and equipment
    5. Labor
    6. Capital
    7. Cultural practices
    8. Other

II. Field growing of nursery stock

  A. Factors affecting selection of stock

    1. Soil and climatic conditions
    2. Customer demands
    3. Speed of plant development
    4. Availability of markets
    5. Land values
    6. Grower's preference
    7. Specialized versus diversified stock

  B. Facility needs

    1. Greenhouses
    2. Storage
    3. Head houses
    4. Lath houses
    5. Display and selling area
    6. Other

  C. Equipment needs

    1. Types
      a. Tractors
      b. Tractor implements (plow, disk, spreader, front-end loader, blade, etc.
      c. Tillers
      d. Hand tools
      e. Plant digger (mechanical)
      f. Irrigation system
    2. Amount

7. Soil mixers
8. Augers
9. Trucks
10. Other

D. Materials

1. Types
2. Amounts
3. Suppliers (identification and selection)
4. Purchasing

E. Plant propagation

1. Stock selection
2. Propagation methods
3. Schedules
4. Use of facilities
5. Labor

F. Soil analysis and preparation

1. Soil samples and interpretation of data
2. Land preparation (plow, disk, lay-off rows)
3. Determination of need for drainage system and type to use
    a. Lay-off system
    b. Installation
4. Spreader calibration
5. Fertilizer and lime application

G. Growing out plants

1. Field setting of plants
    a. Procedures
    b. Labor
2. Fertilization
    a. Types of fertilizers
    b. Amounts to use on various sizes and types of plants
    c. Schedules
    d. Methods of application
    e. Costs
3. Pruning
    a. Methods
    b. Schedules
    c. Costs
4. Weed, insect, and disease control
    a. Identification
    b. Methods of control
    c. Schedules
    d. Techniques or procedures
    e. Labor
    f. Safety
    g. Costs

5. Irrigation
    a. Systems
    b. Determining appropriate type
    c. Installation procedures
    d. Operation
    e. Determining when to irrigate
    f. Amount of water to use
    g. Costs
6. Cultivation
    a. Methods
    b. Need for cultivation
    c. Schedules
    d. Costs

H. Digging plants

1. Methods
    a. Machine
    b. Hand tools
2. Procedures
3. Handling plants
4. Labor
5. Costs

III. Management factors for all nursery operations

A. Personnel

1. Identification of labor needs
2. Recruiting employees
3. Selecting employees
4. Training employees
5. Designating work assignments
6. Supervision
7. Evaluation
8. Personnel actions (promotions, disciplinary actions, etc.)
9. Wages, working hours, working conditions

B. Business analysis

1. Additions of new products and plants
2. Market analysis
3. Business credit needs
4. Locating and securing credit
5. Preparing and implementing sales contracts

C. Professional development

1. Membership in associations
2. Participation in conferences, short courses, and seminars
3. Subscription to trade and professional publications
4. Identification of sources of information on diseases, equipments, plants, etc.

SUGGESTED REFERENCES:

American Standards for Nursery Stock. Chicago: American Association of Nurserymen, Inc., Current Edition.

Bailey, Liberty H. The Liberty Manual. Riverside, NJ: Macmillan Company, Current Edition.

The Ball Red Book. West Chicago, IL: George J. Ball, Inc., Current Edition.

Hartman, Hudson T. and Dale E. Kester. Plant Propagation: Principles and Practices. Englewood Cliffs, NJ: Prentice-Hall, Current Edition.

Pinney, John J. Beginning in the Nursery Business. New York: Rosen, Richards, Press, Inc., Current Edition.

Pinney, John J. Your Future in the Nursery Industry. New York: Rosen, Richards, Press, Inc., Current Edition.

COURSE OUTLINE

HOR 258 TURF GRASS MANAGEMENT

Developed By

Horticulture Technology Competency Curriculum Committee

June 1979

PROGRAM DEVELOPMENT
DEPARTMENT OF COMMUNITY COLLEGES
STATE BOARD OF EDUCATION
RALEIGH, NORTH CAROLINA

HORTICULTURE 258

Turf Grass Management

DESCRIPTION OF COURSE:

Identification and use of the various turf grasses used in residential and commercial lawns with an explanation of the principles of turf grass management. The course includes actual field problems in preparing the soil, seeding, sprigging, laying sod and irrigation of turf grasses. Operation and maintenance of turf equipment will also be emphasized.

COURSE HOURS PER WEEK: Class, 2; Laboratory, 4.

QUARTER HOURS CREDIT: 4

PREREQUISITES: AGR 185, Soil Science and Fertilizers.
AGR 201, Agricultural Chemicals.
HOR 148, Plant Insects and Diseases

COURSE OUTCOMES:

Upon the completion of this course the student should pass with a proficiency determined by the institution, by oral and/or written examinations or other methods, the material contained in the outline of instruction. As a minimum a student should:

(1) Discuss the history of turf usage.

(2) Discuss the development of turfgrasses in the Carolinas.

(3) List the components of the turfgrass industry.

(4) Discuss the future trends of the turf industry.

(5) Identify the warm season and cool season turfgrasses.

(6) List the turfgrasses adapted to the various regions of North Carolina.

(7) Determine the seed germination percentage of a sample of turfgrass.

(8) Discuss the physiology of short growth.

(9) List the cultural requirements of turfgrass growth and development.

(10) List the optimum temperature requirements for the various turfgrasses.

(11) Identify water stress characteristics in lawns.

(12) Take soil samples and interpret results.

(13) Determine drainage problems in lawns.

(14) Correct drainage problems in lawns.

(15) Plow, disk, rake, till, or otherwise prepare soilbed.

(16) Apply amendments to the soil.

(17) Calibrate equipment and apply fertilizer and lime.

(18) Seed a lawn.

(19) Place sod.

(20) Sprig a lawn.

(21) Determine amount of straw needed and apply to seeded lawn.

(22) List the water requirements of various turfgrasses.

(23) List and discuss the types of irrigation systems.

(24) List the components of an overhead irrigation system.

(25) Install and operate an overhead irrigation system.

(26) Perform maintenance procedures on an overhead irrigation system.

(27) Operate and maintain turf equipment.

(28) Follow safety precautions when operating equipment.

OUTLINE OF INSTRUCTION

I. Introduction

A. History of turf usage

1. Biblical references
2. Early use of turf in Asia and Europe

B. Evolution of turf in the United States

1. Climatic zones and regions
2. Development of turfgrasses in the Carolinas
   a. Coastal Region
   b. Sandhills Region
   c. Piedmont Region
   d. Mountain Region

II. The turf industry

  A. Composition of the industry

    1. Recreational (athletic fields, golf courses, parks)
    2. Utiliterian (roadsides, cemetaries, industrial grounds, school grounds, and commercial and residential lawns)

  B. Statistics

    1. Economic
    2. Acreage

  C. Future trends

    1. Population growth and characteristics
    2. Recreation expansion
    3. Environmental emphasis
    4. Employment prospects

III. Identification of turf grasses

  A. Warm season grasses

    1. Identification characteristics
    2. Adaptation

  B. Cool season grasses

    1. Identification characteristics
    2. Adaptation

IV. Physiology of growth and development

  A. Seed germination, growth, and development

  B. Root growth

  C. Shoot growth

    1. Tiller, rhizome and stolon growth
    2. Leaf growth

  D. Turfgrass communities

    1. Competition
    2. Mixtures and blends
    3. Compatability in community

  E. Cultural requirements

    1. Light
      a. Quality

      - b. Duration
      - c. Intensity
    - 2. Temperature
      - a. Variations
      - b. Optimums
      - c. High and low temperature stress
    - 3. Air
      - a. Carbon dioxide and oxygen relations
      - b. Wind factors
      - c. Atmospheric pollution
    - 4. Soil
      - a. Types
      - b. Organic matter
      - c. Fertility
      - d. Acidity
    - 5. Water
      - a. Requirements
      - b. Stress

V. Turf establishment

A. Seedbed preparation

- 1. Planning the lawn area
- 2. Soil testing
- 3. Drainage
  - a. Lay of land
  - b. Problem areas
  - c. Procedures for eliminating drainage problems
- 4. Soil preparation
  - a. Plowing
  - b. Disking
  - c. Leveling
- 5. Soil modification
  - a. Application of soil amendments (sawdust, bark, sand, etc.)
  - b. Application of fertilizer and lime

B. Turf propagation

- 1. Sexual (seed)
  - a. Procedures
  - b. Advantages and disadvantages
- 2. Vegetative
  - a. Types
    - (1) Sprigging
    - (2) Plugging
    - (3) Sodding
  - b. Procedures
  - c. Advantages and disadvantages

VI. Irrigation of turf grasses

A. Determining needs

1. Annual precipitation rate
2. Annual precipitation distribution
3. Soil types and topography
4. Water requirements of various turf grasses

B. Site information

1. Plot or area plan
2. Existing objects
3. Soil factors
4. Type and source of water
5. Prevailing winds

C. Types of irrigation systems - characteristics and use

1. Surface
2. Overhead
3. Subsurface

D. Overhead system

1. Components
    a. Water source
    b. Water distribution lines
    c. Pumps
    d. Sprinkler heads
    e. Controls
2. Basic design
    a. Selecting sprinklers
    b. Locating sprinklers
    c. Determining total G.P.M.
    d. Water supply calculations
    e. Dividing into circuits
    f. Pipe selection and sizing
    g. Selecting of pump, power unit, and method of control
    h. Accessory materials and total system requirements

E. Installing, operating, and maintaining overhead irrigation systems

1. Water distribution lines
2. Pumps
3. Sprinkler heads
4. Controls

VII. Operation and maintenance of turf equipment

   A. Mowers

   B. Seeders and fertilizer spreaders

   C. Aerifiers

   D. Tractors

   E. Plows, disks, harrows

SUGGESTED TEXTS:

Beard, James B. Turfgrass: Science and Culture. Englewood Cliffs, NJ: Prentice-Hall, Inc., Current Edition.

Sprague, Howard B. Turf Management Handbook. Danville, IL: Interstate Printers and Publishers, Inc., Current Edition.

SUGGESTED REFERENCES:

Carolina Lawns. Raleigh, NC: North Carolina Agricultural Extension Service, North Carolina State University, Current Edition.

Dictionary of Turfgrass Terms. New York: The United States Golf Association, Current Edition.

Grass Identification. Blacksburg, VA: Cooperative Extension Service, Virginia Polytechnic Institute, Current Edition.

Hanson, A. A. and F. V. Juska. Turfgrass Science. Madison, WI: American Society for Agronomy, Inc., Current Edition.

Musser, H. Burton. Turf Management. New York: McGraw-Hill Book Company, Inc., Current Edition.

Schery, Robert W. The Lawn Book. New York: Macmillan Company, Current Edition.

Sunset Editors. Lawns and Ground Covers. Menlo Park, CA: Lane Publishing Company, Current Edition.

Turfgrass Guide. Blacksburg, VA: Cooperative Extension Service, Virginia Polytechnic Institute, Current Edition.

COURSE OUTLINE

HOR 260 LANDSCAPE CONSTRUCTION

Developed By

Horticulture Technology Competency Curriculum Committee

June 1979

PROGRAM DEVELOPMENT
DEPARTMENT OF COMMUNITY COLLEGES
STATE BOARD OF EDUCATION
RALEIGH, NORTH CAROLINA

HORTICULTURE 260

Landscape Construction

DESCRIPTION OF COURSE:

This course is designed to teach the student how to plan the total landscape environment. Emphasis will be placed on the construction of and proper placement of masonry walls, rock walls, patios, walks, etc., blending them in with appropriate plant materials.

COURSE HOURS PER WEEK: Class, 2; Laboratory, 4.

QUARTER HOURS CREDIT: 4.

PREREQUISITE: HOR 251, Landscape Planning I.

COURSE OUTCOMES:

Upon the completion of this course the student should pass with a proficiency determined by the institution, by oral and/or written examinations or other methods, the material contained in the outline of instruction. As a minimum a student should:

(1) List and describe the characteristics of construction materials.

(2) Estimate the amount and costs of materials for various construction projects.

(3) Install fences using different types of materials.

(4) Install walls using railroad ties, block, brick, rock, or other materials.

(5) Construct planters.

(6) Construct garden bench seats.

(7) Install driveways and walks using various types of materials.

(8) Install terraces and patios using brick, concrete, and other materials.

(9) Install proper edging for various landscape areas.

(10) Construct rock gardens and other specialized areas.

(11) Apply basic carpentry skills in building and repairing displays, slathouses, storage sheds, greenhouses, and other construction projects.

(12) Construct lawn furniture and picnic tables.

(13) Erect suitable lighting for recreation and garden areas.

OUTLINE OF INSTRUCTION

I. Introduction

A. Definition and scope

B. Terminology

C. Use of construction projects in the landscape

II. Construction materials

A. Concrete

1. Water-cement ratio strength law
2. Plasticity
3. Economy factors
4. Form requirements
5. Mixing, placing, finishing, and curing concrete
6. Reinforcing
7. Types of joints
8. Rules
   a. Fuller's rule
   b. Proportional rule
9. Costs

B. Brick

1. Uses
2. Patterns
3. Base
   a. Sand
   b. Concrete
4. Procedures of construction
5. Tools
6. Costs

C. Stone

1. Types and characteristics
2. Patterns
3. Combinations
4. Uses
5. Thickness
6. Base
   a. Sand
   b. Concrete

7. Procedures of construction
8. Tools
9. Costs

D. Soil cement

1. Types
   a. Compacted soil and cement
   b. Cement and modified soil
   c. Plastic soil and cement
2. Composition
3. Uses
4. Procedures for construction
5. Finishes
6. Costs

E. Asphalt

1. Types
2. Composition
3. Uses
4. Procedures for construction
5. Costs

F. Wood

1. Types
2. Uses
3. Procedures for construction
4. Costs

G. Cement blocks

1. Types
2. Uses
3. Procedures for construction
4. Costs

III. Preparation of site

A. Site analysis

B. Grading

C. Drainage

D. Stabilization

E. Access routes and accessibility

IV. Construction projects

A. Walks and driveways

1. Laying out
2. Grades
3. Drainage
4. Foundation
5. Materials
6. Patterns
7. Procedures
8. Costs

B. Walls

1. Types
    a. Free-standing
    b. Retaining
        (1) Batters
        (2) Strength requirements
2. Laying out
3. Designs
4. Materials
5. Procedures
6. Costs

C. Steps

1. Design aspects
    a. Rules (tread-riser proportions)
        (1) Olmstead
        (2) Boston
2. Uses
3. Elevation (horizontal distance ratio)
4. Materials
5. Laying out
6. Construction techniques
    a. Drainage and footings
    b. Check walls
    c. Reinforcement
        (1) Rods
        (2) Mesh
7. Costs

D. Terraces and patios

1. Planned usage
2. Covered or exposed
3. Laying out
4. Materials
5. Construction procedures
6. Costs

E. Fences

1. Kinds
    a. Stockade
    b. Post and rail
    c. Board
    d. Basketweave
    e. Louver
    f. Wire
2. Uses
3. Laying out
4. Materials
5. Placement procedures
    a. Drainage provisions for posts
    b. Alinement
    c. Level
6. Construction procedures
7. Comparative costs and lasting qualities
8. Preservatives

F. Planters

1. Types
    a. Built-in
    b. Portable
2. Construction materials
3. Construction methods
    a. Space requirements
    b. Plant size
    c. Maintenance requirements
    d. Permanence
4. Costs

G. Lawn furniture, picnic tables, and bench seats

1. Design
2. Uses
3. Materials
4. Construction techniques
5. Costs

H. Rock gardens

1. Design
2. Uses
3. Materials
4. Construction techniques
5. Costs

I. Building and repair of displays, slathouses, storage sheds, greenhouses, etc.

1. Design

    2. Uses
    3. Materials
    4. Construction techniques
    5. Costs

J. Lighting

    1. Uses
    2. Types
    3. Materials
    4. Construction procedures
    5. Electrical procedures
    6. Costs

K. Edging procedures

    1. Lawns
    2. Walks
    3. Beds

SUGGESTED REFERENCES:

Eckbo, Garrett. The Art of Home Landscaping. New York: F. W. Dodge Corporation, Current Edition.

Harris, John H., and R. Gordon Halfacre. Keep 'Em Growing. Raleigh, NC: Litho Industries, Inc., Current Edition.

Jones, Mack M. Shopwork on the Farm. New York: McGraw-Hill Book Company, Current Edition.

Kramer, Jack. Gardening and Home Landscaping Guide. New York: Arco Publishing Company, Current Edition.

Parker, Harry. Simplified Design of Structural Timber. New York: John Wiley and Sons, Inc., Current Edition.

Parker, Harry and Harold D. Hauf. Simplified Design of Reinforced Concrete. New York: John Wiley and Sons, Inc., Current Edition.

Sunset Editors. Garden and Patio Building Book. Menlo Park, CA: Lane Publishing Company, Current Edition.

Weber, Nelva M. How to Plan Your Own Home Landscape. Indianapolis, IN: Bobbs-Merrill Company, Inc., Current Edition.

COURSE OUTLINE

BUS 195 SMALL BUSINESS OPERATIONS

Developed By

Horticulture Technology Competency Curriculum Committee

June 1979

PROGRAM DEVELOPMENT
DEPARTMENT OF COMMUNITY COLLEGES
STATE BOARD OF EDUCATION
RALEIGH, NORTH CAROLINA

BUSINESS 195

Small Business Operations

DESCRIPTION OF COURSE:

An introduction to the business world, problems of small business operation, basic business law, business forms and records, financial problems, ordering and inventorying, layout of equipment and offices, methods of improving business, and employer-employee relations.

COURSE HOURS PER WEEK: Class, 3; Laboratory, 0.

QUARTER HOURS CREDIT: 3

PREREQUISITE: None.

COURSE OUTCOMES:

Upon the completion of this course the student should pass with a proficiency determined by the institution, by oral and/or written examinations or other methods, the material contained in the outline of instruction. As a minimum, a student should:

(1) Define economic democracy.

(2) List and discuss problems that are typically faced by small businesses.

(3) List the major causes of small business failure.

(4) List and illustrate the major differences between the forms of business ownership.

(5) Describe the functions of management.

(6) Discuss the importance of human relations in management.

(7) Keep records of receipts and expenses.

(8) Keep employee work records.

(9) Assist in records audit.

(10) File records and other materials.

(11) Develop adequate record system for ordering and restocking plants and materials, pricing, determining quantities for production and for profit analysis.

(12) Keep maintenance and repair records on equipment.

(13) Take periodic inventory.

(14) Keep current inventory of merchandise for sale.

(15) Check received merchandise against invoice listings.

(16) Check invoices for errors.

(17) Store received merchandise.

(18) Order replacement and/or new merchandise.

(19) Arrange for transportation of materials purchased.

(20) Order repair parts for business vehicles and equipment.

(21) Develop customer credit records.

(22) Arrange trade-ins and credit terms.

(23) Check credit references of customers.

(24) Prepare and mail bills to collect accounts due.

(25) Prepare employee payroll.

(26) List the basic procedures needed for obtaining loans.

(27) Prepare the various financial statements.

(28) Prepare annual depreciation schedules.

(29) Allocate monies in preparing budgets.

(30) Determine need for, select reputable insurer, and purchase comprehensive business insurance.

(31) Analyze business enterprises on cost and return basis.

(32) Discuss business laws, tax laws, and laws pertaining to hiring, paying, and treating employees.

(33) Administer social security and other employee benefit programs.

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OUTLINE OF INSTRUCTION

I. American economic system

  A. Economic democracy

  B. Standard of living

C. Factors of production

D. Purpose of business

E. Opportunities in a democracy

II. Problems of small business operation

A. Identification of problems

B. Causes of small business failure

C. Comparison of small and large business problems

D. Concepts and solutions to problems

III. Business organization

A. Forms of business ownership

1. Sale proprietorship
2. Partnership
3. Corporation
4. Franchising

B. Internal organization

IV. Management of the business firm

A. Functions and importance of management

1. Objectives
2. Levels of management
3. Functions of management
4. Leadership

B. Managerial organization

1. Formal organization
2. Centralization and decentralization
3. Principles of organization
4. Organization chart

C. Human relations in management

1. Employee-employer relations
2. Motivation
3. Needs
4. Morale

D. Production management

1. Production processes

2. Production control
3. Purchasing
    a. Record system
        (1) Receipts and expenses
        (2) Equipment
        (3) Employee work records
        (4) Maintaining and filing
    b. Suppliers
    c. Invoices (ordering and checking merchandise received)
4. Inventory
    a. Schedules
    b. Procedures

D. Business transactions

1. Cash sales
2. Credit sales
    a. Credit references of customers
    b. Credit terms
    c. Collecting due accounts
3. Negotiate trade-ins
4. Employee payroll

V. Financing the business firm

A. Money and the banking system

1. Money
2. Banking system
3. Federal Deposit Insurance Corporation

B. Sources of funds

1. Banks
2. Investors
3. Small business administration
4. Other

C. Loans

1. Types
    a. Short-term
    b. Long-term
2. Procedures for obtaining loans

VI. Business accounting

A. Purpose of accounting analysis

B. Financial statements

1. Personnel statement
2. Business balance sheet

        3. Profit and loss statements
        4. Fixed asset schedule
        5. Cash flow
            a. Sales
            b. Purchases
            c. Expenses

    C. Ratios as tools of management

        1. On investments
        2. On sales
        3. Comparing ratios

    D. Depreciation schedules

    E. Budgeting and forecasting

        1. Simple budgeting
        2. Determining future financial needs

VII. Insurance and risk

    A. Controlling risks

    B. Types of insurance

    C. Selection of appropriate insurance amount and insurer

VIII. Legal, government, and social environment

    A. Law and business

        1. Types of law
        2. Areas of law that relate to business
        3. Contracts
        4. Uniform commercial code

    B. Taxes and social security

    C. OSHA regulations

    D. Social controls

        1. Competition
        2. Control of natural monopolies
        3. Legal instruments of control
        4. Patent, copyright, and trademark legislation

SUGGESTED TEXT:

Pickle, Hal B. and Royce L. Abrahamson. *Introduction to Business*. Pacific Palisades, CA: Goodyear Publishing Company, Inc., Current Edition.

SUGGESTED REFERENCES:

Castle, Emery N., and Manning H. Becker. *Farm Business Management*. New York: Macmillan Company, Current Edition.

Curran, Ward S. *Principles of Financial Management*. New York: McGraw-Hill Book Company, Current Edition.

Hailes, William D., Jr., and Raymond T. Hubbard. *Small Business Management*. Albany, NY: Delmar Publishers, Inc., Current Edition.

Haimann, Theo and Raymond Hilgert. *Supervision: Concepts and Practice of Management*. Cincinnati, OH: Southwestern Publishing Company, Current Edition.

COURSE OUTLINE

HOR 252 LANDSCAPE PLANNING II

Developed By

Horticulture Technology Competency Curriculum Committee

June 1979

PROGRAM DEVELOPMENT
DEPARTMENT OF COMMUNITY COLLEGES
STATE BOARD OF EDUCATION
RALEIGH, NORTH CAROLINA

HORTICULTURE 252

Landscape Planning II

DESCRIPTION OF COURSE:

A continuation of HOR 251 with increased emphasis on the planning, development, and design of residential and commercial landscape areas. An introduction to elementary surveying will be included. In addition, fundamentals of landscape economics such as costs, contracts, calculating areas, volumes, and plant quantities for landscape projects will be covered.

COURSE HOURS PER WEEK: Class, 2; Laboratory, 4.

QUARTER HOURS CREDIT: 4.

PREREQUISITES: HOR 135, Landscape Drafting.
HOR 251, Landscape Planning I.

COURSE OUTCOMES:

Upon the completion of this course the student should pass with a proficiency determined by the institution, by oral and/or written examinations or other methods, the material contained in the outline of instruction. As a minimum, a student should:

(1) Consult with client to determine his/her needs and wishes for a landscape design.

(2) Develop a complete landscape design of a residential and commercial location.

(3) Read and interpret landscape plans drawn by designers and architects.

(4) Carry out or implement landscape design plans.

(5) Determine appropriate plant replacements if specified plants are not available in the landscape plan.

(6) Measure distances using steel tapes.

(7) Use an engineer's transit and level.

(8) Calculate the area of a tract of land.

(9) Locate existing water and sewer lines in landscape areas.

(10) Develop cost analyses of landscape plans.

(11) Write up contracts for landscape jobs.

OUTLINE OF INSTRUCTION

I. Introduction and review

A. Landscape planning

1. Landscape location: residential
    - a. Public area
    - b. Private area
    - c. Service area
    - d. Foundation area
    - e. Border plantings
    - f. Walk and drive plantings
    - g. Specialty area
2. Landscape location: commercial
    - a. Public area
    - b. Private area
    - c. Service area
    - d. Foundation area
    - e. Border plantings
    - f. Walk and drive plantings
    - g. Specialty areas
3. Landscape property factors
    - a. Utility lines
    - b. Water lines
    - c. Drainage and contours
    - d. Site factors
    - e. Soil factors
    - f. Plant selection

II. Landscape surveying

A. Definitions and notekeeping

1. Kinds of surveying
2. Field work
    - a. Typical surveys
    - b. Care and handling of instruments
    - c. Precision instruments
    - d. Field notes
3. Office work
    - a. General
    - b. Computations
    - c. Significant figures
    - d. Graphical and mechanical methods
    - e. Drafting
4. Errors
    - a. Sources of error
    - b. Kinds of error
    - c. Theory of probability

B. Measurement of distance

1. Methods
2. Equipment for measuring
3. Handling the steel tape
   a. Measuring on level ground
   b. Slope measurements
   c. Errors in taping
4. Corrections
   a. Mistakes in taping
   b. Erecting perpendicular to line

C. Direct leveling

1. General
2. Instruments (characteristics and use)
   a. Engineer's level
   b. Dumpy level
   c. Wye level
   d. Locke and Abney hand levels
   e. Engineer's transit
   f. Leveling rods
3. Setting up instruments
   a. Reading the rods
   b. Reading verniers
4. Adjustment of instruments

D. Differential and profile leveling

1. Differential leveling
   a. Procedure
   b. Balancing backsight and foresight distances
   c. Notes
   d. Mistakes and errors
   e. Precision
2. Profile leveling
   a. Notes
   b. Vertical curves
   c. Plotting profiles
   d. Fixing grades
   e. Leveling for earthwork

E. Measurement of angles and directions

1. General considerations
2. Magnetic meridian
   a. Magnetic declination
   b. Establishing the meridian
3. Angles and directions
   a. Bearings
   b. Azimuths
   c. Deflection angles
   d. Interior angles

4. Traverses
5. Triangulation

F. Calculation of land areas

1. Methods of determining area
    a. Area by coordinates
    b. Area of tract with irregular boundaries
2. Offsets
    a. Regular intervals
    b. Irregular intervals

III. Landscape cost analysis

A. Landscape plan development

1. Landscape planning costs
2. Legal fees
3. Bonding
4. Contracts
5. Bidding procedures
6. Area, volume, and quantity calculation of plants and materials

B. Landscape materials cost

1. Trees
2. Shrubs
3. Vines and groundcovers
4. Fertilizers and antidessicants
5. Supplies

C. Landscape installation costs

1. Site preparation
2. Labor
3. Job-site costs
4. Overhead

IV. Contracts

A. Public and private construction

B. Types of contracting

1. General contracting
2. Subcontracting

C. Professional code of ethics

D. Law of contracts

1. Essential elements
2. Statute of frauds

3. Changes in contracts
4. Termination

E. Types of contracts

1. Competitive bid
2. Lump sum
3. Unit price
4. Combinations
5. Negotiated

F. Specification writing

1. Principles
    a. Style
    b. Grammar
    c. Brevity
    d. Clarity
2. General provisions
    a. Description of work
    b. Drawings
    c. Work and material by others
    d. Conflicts and omissions
    e. Tests
    f. Wages
3. Technical provisions
    a. Types
    b. Specifications for materials
    c. Specifications for work to be performed
    d. Use of standard specifications

SUGGESTED TEXT:

Ingels, Jack. Landscaping Principles and Practices. Albany, NY: Delmar Publishers, Division of Litton Education Publishers, Inc., Current Edition.

SUGGESTED REFERENCES:

Aul, Henry B. How to Plan Modern Home Gardens. New York: Sheridan House, Current Edition.

Davis, Raymond and J. W. Kelly. Short Course in Surveying. New York: McGraw-Hill Book Company, Inc., Current Edition.

Eckbo, Garrett. Urban Landscape Design. New York: McGraw-Hill Book Company, Inc., Current Edition.

Halfacre, R. Gordon and Anne Rogers Shawcroft. Carolina Landscape Plants. Raleigh, NC: Sparks Press, Current Edition.

Hoover, Norman K. *Approved Practices in Beautifying the Home Grounds*. Danville, IL: Interstate Printers and Publishers, Inc., Current Edition.

Williams, George S. *Nursery Crops and Landscape Designs for Agribusiness Studies*. Danville, IL: Interstate Printers and Publishers, Inc., Current Edition.

COURSE OUTLINE

HOR 257 NURSERY MANAGEMENT II

Developed By

Horticulture Technology Competency Curriculum Committee

June 1979

PROGRAM DEVELOPMENT
DEPARTMENT OF COMMUNITY COLLEGES
STATE BOARD OF EDUCATION
RALEIGH, NORTH CAROLINA

HORTICULTURE 257

Nursery Management II

DESCRIPTION OF COURSE:

A study of container grown nursery operations to acquaint the student with the diversity of nursery plant production, equipment, and operation detail. Areas of instruction include determination of plants to be grown, soil requirements, facilities, propagation, fertilization, pruning, disease and pest control, irrigation, selling and energy saving practices.

COURSE HOURS PER WEEK: Class, 2; Laboratory, 4.

QUARTER HOURS CREDIT: 4

PREREQUISITE: HOR 256, Nursery Management I.

COURSE OUTCOMES:

Upon the completion of this course the student should pass with a proficiency determined by the institution, by oral and/or written examinations or other methods, the material contained in the outline of instruction. As a minimum a student should:

(1) Discuss the history and scope of the nursery industry.

(2) List the social and economic factors related to the nursery industry.

(3) List and briefly describe the various types of nurseries.

(4) Identify the factors affecting the types of container plants to be grown.

(5) Efficiently use the facilities necessary for container grown stock.

(6) Operate efficiently all equipment used in the nursery.

(7) Follow safety precautions for equipment.

(8) Determine appropriate equipment to use for various jobs.

(9) Make minor changes to agricultural and industrial equipment to adopt it to the nursery operation.

(10) Maintain equipment and small motors used in the nursery on a regular basis.

(11) Make minor repairs to equipment and facilities.

(12) Keep facilities, work, and selling areas neat and clean.

(13) Clean and sharpen hand tools.

(14) Select proper media and prepare media according to soil tests.

(15) Select proper sized containers for various plants.

(16) Sterilize media.

(17) Pot and repot plants properly.

(18) Prepare the container beds including the drainage system.

(19) Space containers properly in beds.

(20) Set up and maintain irrigation system.

(21) Operate irrigation system.

(22) Mulch plants properly for winter protection.

(23) Prune plants at proper time using appropriate methods.

(24) Identify weeds, pests, and diseases.

(25) Remove dead or undesirable stock.

(26) Determine methods of control needed to eradicate weeds, pests, and diseases.

(27) Apply appropriate control measures.

(28) Discuss factors affecting control measures.

(29) Follow all safety factors when administering control measures.

(30) Label and price-mark plants that are on display for sale.

(31) Provide customers with cultural requirements of plants.

(32) Handle sales transactions correctly and courteously.

(33) Apply energy-saving methods in nursery operations.

- -

OUTLINE OF INSTRUCTION

I. Introduction

A. History of the nursery industry

B. Scope of the nursery industry

C. Social and economic factors related to the nursery industry

II. Types of nurseries

A. Wholesale

B. Retail

C. Mail order

D. Garden center

E. Other

III. Methods of growing plants

A. Field grown

B. Container grown

C. Combination

IV. Container grown nursery stock

A. Selection of nursery stock

1. Customer demands
2. Personal interests
3. Economic factors
4. Climatic factors
5. Natural resources
6. Speed of plant development

B. Facilities (characteristics, design, use, and maintenance)

1. Greenhouses
2. Head houses
3. Lath houses
4. Storage
5. Cold frames
6. Hot beds
7. Plant beds
8. Sales yard or facility
9. Other

C. Equipment (operation and basic maintenance and repair)

1. Tractors
2. Tractor implements (disk, plow, blade, auger, etc.)
3. Irrigation sytems

    4. Hand tools
    5. Soil mixers
    6. Trucks
    7. Loaders
    8. Tillers
    9. Other

D. Soils

    1. Media
    2. Soil amendments
    3. Testing
    4. Preparation, mixing, and potting

E. Propagation

    1. Stock selection
    2. Methods
    3. Schedules
    4. Use of facilities
    5. Labor

F. Growing out plants

    1. Potting and repotting
        a. Pots
            (1) Types
            (2) Sizes
            (3) Costs
        b. Procedures
        c. Schedules
    2. Fertilization
        a. Types
        b. Amounts to use on various plants
        c. Schedules
        d. Methods of application
        e. Costs
    3. Pruning
        a. Methods
        b. Schedules
        c. Costs
    4. Weed, insect, and disease control
        a. Identification
        b. Methods
        c. Schedules
        d. Techniques or procedures
        e. Labor
        f. Safety
        g. Costs
    5. Watering and irrigation
        a. Methods or systems
        b. Determining need for water

        c. Procedures for installation
        d. Operation
        e. Costs
    6. Container beds
        a. Size
        b. Layout
        c. Construction
        d. Drainage
        e. Spacing of plants
        f. Winter protection of plants
        g. Bed renovation

G. Selling of plants

1. Attractive and convenient sales area
2. Plants properly identified and priced
3. Adequate information about plants provided to customers
4. Sales transactions prompt, courteous, and correct
5. Plants properly handled and packed in vehicles

H. Energy conservation

1. Properly designed and insulated facilities
2. Layout of nursery
3. Low maintenance
4. Tandem hauling
5. Reduced temperatures in cold weather
6. Windbreaks
7. Other

SUGGESTED REFERENCES:

Bailey, Liberty H. The Liberty Manual. Riverside, NJ: Macmillan Company, Current Edition.

The Ball Red Book. West Chicago, IL: George J. Ball, Inc., Current Edition.

Hartman, Hudson T. and Dale E. Kester. Plant Propagation: Principles and Practices. Englewood Cliffs, NJ: Prentice-Hall, Current Edition.

Pinney, John J. Beginning in the Nursery Business. New York: Rosen, Richards, Press, Inc., Current Edition.

Pinney, John J. Your Future in the Nursery Industry. New York: Rosen, Richards, Press, Inc., Current Edition.

COURSE OUTLINE

HOR 264 GREENHOUSE MANAGEMENT

Developed By

Horticulture Technology Competency Curriculum Committee

June 1979

PROGRAM DEVELOPMENT
DEPARTMENT OF COMMUNITY COLLEGES
STATE BOARD OF EDUCATION
RALEIGH, NORTH CAROLINA

HORTICULTURE 264

Greenhouse Management

DESCRIPTION OF COURSE:

A study of the fundamentals and practices of greenhouse plant production, including the control of heat, light, ventilation, and humidity. Construction and management of plastic, glass and fiberglass greenhouses are studied. Crop studies include both cut flower and pot plant crops.

COURSE HOURS PER WEEK: Class, 2; Laboratory, 4.

QUARTER HOURS CREDIT: 4.

PREREQUISITES: AGR 201, Agricultural Chemicals.
HOR 144, Plant Propagation.
HOR 148, Plant Insects and Diseases.

COURSE OUTCOMES:

Upon the completion of this course the student should pass with a proficiency determined by the institution, by oral and/or written examinations or other methods, the material contained in the outline of instruction. As a minimum a student should:

(1) Identify media materials.

(2) Shred or screen different media materials.

(3) Determine soil mix for specific plant requirements.

(4) Sterilize mixed soils.

(5) Apply correct amendments to soil mix.

(6) Fill benches, pots, and flats.

(7) Make propagation and seed sowing schedules.

(8) Sow seed in appropriate containers.

(9) Make plant cuttings and put in appropriate containers and media for propagation.

(10) Transplant seedlings to pots, flats, etc.

(11) Label planted specimens.

(12) Water greenhouse stock.

(13) Prune and thin plants.

(14) Fertilize plants.

(15) Pinch potted plants.

(16) Control temperature with fans and heaters.

(17) Control humidity with ventilating fans and humidifiers.

(18) Control the type and amount of light.

(19) Force bulbs.

(20) Force potted plants to bloom at seasonal times.

(21) Fumigate greenhouses.

(22) Identify and control weeds with chemicals and other methods.

(23) Identify, remove, and destroy diseased plants.

(24) Identify and control plant insects and diseases.

(25) Remove plants from bed to sell.

(26) Select proper pot sizes for replanting plants.

(27) Repair storage shelves, lathhouses, and greenhouses.

(28) Glaze windows.

(29) Recover greenhouses.

(30) Determine costs of producing greenhouse crops.

(31) Determine marketing possibilities for greenhouse crops.

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OUTLINE OF INSTRUCTION

I. Introduction

A. History and development of greenhouses

B. Importance of greenhouse crops

1. United States
2. North Carolina

C. Need for greenhouses

II. Greenhouse structures

   A. Location

   B. Types

      1. Design
      2. Construction

   C. Size and arrangement

   D. Framework

   E. Work rooms

   F. Benches

   G. Flats

III. Requirements of the greenhouse and plant growth

   A. Temperature control

   B. Air movement and exchange

   C. Adequate light

   D. Carbon dioxide

   E. Oxygen

   F. Moisture

   G. Growing medium

IV. Greenhouse temperature regulation

   A. Heat requirement calculations

   B. Sources of heat

   C. Methods of distributing heat

   D. Operational procedures for heating

   E. Cooling systems

      1. High-pressure mist
      2. Fan and pad
      3. Shade cloth
      4. Paint

V. Light as a regulator of plant activity

A. Process of photosynthesis

B. Affect of radiant energy

C. Affect of day length on plant performance

D. Light requirements of plants

E. Types of lighting

F. Adjustment of light periods

VI. Air movement and exchange

A. Ventilation systems

B. Fans and heaters

C. Operational procedures for controlling air movement

D. Humidity control

VII. Carbon dioxide and oxygen content

A. Affect of CO_2 and O_2 on plant growth

B. Methods to maximize CO_2 and O_2 levels

VIII. Moisture regulation

A. Types of watering systems

B. Operation procedures

C. Effect of water on plants

D. Determination of watering schedules

IX. Soil and growing media

A. Types of media materials

B. Soil amendments

C. Soil mixes and formulas

1. Shredding or screening media materials
2. Applying soil amendments
3. Formulas for specific plant requirements

        4. Sterilizing mixed soils
            a. Methods
            b. Procedures
        5. Filling containers with soil mix

    D. Media costs

X. Plant propagation

    A. Methods

        1. Sexual
        2. Asexual

    B. Schedules

    C. Pots and containers

    D. Procedures

    E. Costs

XI. Growing of greenhouse stock

    A. Transplanting of seedlings

        1. Flats
        2. Pots
        3. Other containers
        4. Labeling

    B. Fertilization

        1. Types of fertilizer
        2. Amount
        3. Schedules
        4. Methods of application
        5. Calibration
        6. Procedures for application
        7. Costs

    C. Pruning and/or pinching plants

        1. Methods
        2. Schedules
        3. Procedures
        4. Labor
        5. Costs

    E. Weed, insect, and disease control

        1. Identification
        2. Methods of control

3. Schedules
4. Calibration of equipment
5. Procedures for implementing controls

E. Watering

1. Schedules
2. Use of automatic and hand watering equipment

XII. Determining costs of producing greenhouse crops

A. Costs

1. Land and buildings
2. Equipment
3. Labor
4. Management
5. Utilities
6. Supplies
7. Taxes
8. Depreciation
9. Other

B. Procedures for computing costs on square feet of bench space

XIII. Construction and repairing

A. Glazing windows

1. Materials
2. Procedures

B. Recovering greenhouses

1. Tools
2. Materials
3. Procedures
4. Costs

C. Structural repairs to lathhouses, greenhouses, etc.

1. Tools
2. Materials
3. Procedures
4. Costs

XIV. Management of marketing

A. Evaluation of the market potential

1. Wholesale
2. Retail

B. Analysis of market

   1. Product
   2. Promotion
   3. Place
   4. Price

C. Plan for customer satisfaction

   1. Produce quality plants of variety desired
   2. Produce plants at time when most desired
   3. Package plants attractively
   4. Price plants reasonably

D. Vertical integration and marketing

   1. Definition
   2. Advantages and disadvantages

SUGGESTED TEXT:

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SUGGESTED REFERENCES:

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Eaton, Jerome A. Gardening Under Glass. New York: Macmillan Company, Current Edition.

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APPENDIX A-1

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APPENDIX A-2

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RALEIGH 27611

APPENDIX B-1

INTRODUCTORY CAREER OPPORTUNITY LETTER

MEMORANDUM

TO: Selected Horticulture Employers

FROM: Coy L. Hudson, Assistant Director, Special Programs

SUBJECT: Career Opportunity Survey

The Program Development Division, Department of Community Colleges, is conducting a project to determine the competencies required by employers in order for their employees to be successful on the job. This project is designed to: (1) develop a validated list of tasks performed by employees in a given job; (2) develop from the tasks, competencies which are required to perform successfully in the job; (3) develop curriculum guidelines; and (4) develop and/or revise curriculum materials based on the guidelines to assist educational personnel in providing quality occupational education programs. You, as a member of the employment field, can provide essential information for the development of competency-based programs.

You have been selected to assist in determining employment opportunities in the field of Horticulture Technology. The enclosed form identifies careers open to individuals in this field. These opportunities may or may not exist. Your response to the survey will contribute to the identification of jobs that do exist.

After you have completed the survey, please return it in the stamped, self-addressed envelope by ____________________. Your responses will be compiled with the responses of other individuals completing the survey, with no individual responses identified.

Your participation in this project by the completion of this survey is greatly appreciated.

CLH/ljp

Enclosure

APPENDIX B-2

CAREER OPPORTUNITY SURVEY

HORTICULTURE TECHNOLOGY

The following employment opportunities have been identified as being possible careers open to individuals in Horticulture Technology. These opportunities may or may not exist.

Please indicate your opinion as to whether these employment opportunities do exist by checking (✓) the yes or no block next to the career identified. Please add comments if you desire that help explain your response.

D.O.T. CODE	CAREER OPPORTUNITY	YES	NO	COMMENTS
405.161-014	Horticultural-Specialty Grower, Field			
405.161-018	Horticultural-Specialty Grower, Inside			
408.687-014	Landscape Worker			
408.161-010	Landscape Gardener			
180.167-042	Nursery Manager			
405.687-014	Nursery Worker			
405.361-010	Plant Propagator			
408.684-018	Tree Pruner			
406.684-014	Groundskeeper			
405.684-014	Greenhouse Worker			
405.131-010	Greenhouse Superintendent			
182.167-014	Landscape Contractor			
403.687.010	Orchard Worker			

D.O.T. CODE	CAREER OPPORTUNITY	YES	NO	COMMENTS
408.684-010	Lawn-Service Worker			
272.357-022	Salesperson, Horticultural and Nursery Products			
142.081-010	Floral Designer			
408.381-010	Pest-Control Worker			
929.683-014	Tractor Operator			
405.687-014	Landscape Construction Worker			
405.684-014	Garden Center Worker			
001.261-014	Landscape Drafter			

APPENDIX B-3

CAREER OPPORTUNITY SURVEY RESULTS

HORTICULTURE TECHNOLOGY

The following information was obtained from a random sample of the members of the North Carolina Association of Nurserymen. A total of 105 surveys were mailed and 38 were returned, or 36%. This information assists in validating the employment opportunities that are available in North Carolina in the field of Horticulture Technology.

D.O.T. CODE	CAREER OPPORTUNITY	YES	NO	NO RESPONSE
405.161-014	Horticultural-Specialty Grower, Field	34	2	2
405.161-018	Horticultural-Specialty Grower, Inside	34	2	2
408.687-014	Landscape Worker	28	7	3
408.161-010	Landscape Gardener	27	1	10
180.167-042	Nursery Manager	33	2	3
405.687-014	Nursery Worker	32	1	5
405.361-010	Plant Propagator	22	4	12
408.684-018	Tree Pruner	19	5	14
406.684-014	Groundskeeper	25	2	11
405.684-014	Greenhouse Worker	26	4	8
405.131-010	Greenhouse Superintendent	31	1	6
182.167-014	Landscape Contractor	4	22	12
403.687-010	Orchard Worker	6	18	14
408.684-010	Lawn-Service Worker	25	8	5
272.357-022	Salesperson, Horticultural and Nursery Products	29	2	8

D.O.T. CODE	CAREER OPPORTUNITY	YES	NO	NO RESPONSE
142.081-010	Floral Designer	5	22	11
408.381-010	Pest-Control Worker	7	20	11
929.683-014	Tractor Operator	9	24	5
405.687-014	Landscape Construction Worker	23	3	12
405.684-014	Garden Center Worker	26	3	9
001.261-014	Landscape Drafter	20	8	10

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APPENDIX C-1

INTRODUCTORY TASK VALIDATION LETTER

MEMORANDUM

TO: Selected Horticulturists

FROM: Coy L. Hudson, Assistant Director, Special Programs

SUBJECT: Task Inventory of Horticulture Occupations

The Department of Community Colleges is conducting a project to evaluate and update horticulture programs in the system. The first step in this project was to identify appropriate positions or job opportunities that may be held by graduates of horticulture programs.

The second step in this project is to identify the tasks and levels of competency needed in order to perform satisfactorily in the various horticulture occupations. Enclosed is an inventory of tasks that hopefully you will respond to in terms of which tasks are necessary and the level of competency of each task. Your opinion on this inventory will provide guidance for the development of quality horticulture programs in the Community College System.

Please assist us with this project by completing the enclosed task inventory. Just follow the simple directions and return the inventory in the stamped, self-addressed envelope by ____________________. Your responses will be compiled with the responses of other individuals completing the inventory, with no individual responses identified.

Thank you very much for assisting in this project.

CLH/ljp

Enclosure

APPENDIX C-2

COMPETENCY-BASED HORTICULTURE CURRICULUM STUDY

TASKS PERFORMED BY HORTICULTURISTS

Directions: The following inventory is a list of tasks which may or may not be performed by persons in horticulture occupations. Please use the following key to make your evaluation of the level of competency of each task. The person should possess:

1. no competency in this activity
2. slight competency in this activity
3. moderate competency in this activity
4. considerable competency in this activity
5. complete competency in this activity

Please answer all questions. There are no right or wrong answers. What is important is how you rate each competency.

Please circle the rating (1-2-3-4-5) which best indicates your feelings as to the level of competency of each task. At times your exact feelings will not be represented, but select the answer nearest your feelings. Please do not omit any tasks. Also, at the bottom of each task listing for each category, please add additional tasks which you feel individuals need in horticulture occupations and rate each task you add.

Definition: Competent (Webster) 1. Well qualified; capable; fit.

Competency (Webster) 2. Condition or quality of being competent.

no slight moderate considerable complete TASKS

A. Plant Identification and Cultural Requirements

1. 1 2 3 4 5 Identify plants by common and scientific name (annuals, biennials, perennials, etc.).

2. 1 2 3 4 5 Use resource material to identify unknown plants which cannot be identified by visual inspection.

3. 1 2 3 4 5 Determine cultural requirements of plants (light, soil, moisture, temperature, etc.).

	no	slight	moderate	considerable	complete	TASKS
						Additional Tasks
	1	2	3	4	5	
	1	2	3	4	5	
B.	Preparing a Landscape					
4.	1	2	3	4	5	Determine time of year to plant various species.
5.	1	2	3	4	5	Select proper planting site for different types of plants.
6.	1	2	3	4	5	Lay out space requirements.
7.	1	2	3	4	5	Clear brush and unwanted plants.
8.	1	2	3	4	5	Fell and remove trees.
9.	1	2	3	4	5	Take soil sample and interpret results.
10.	1	2	3	4	5	Plow, disk, rake, till, or otherwise prepare land.
11.	1	2	3	4	5	Prepare flower and shrub beds for plantings.
12.	1	2	3	4	5	Fumigate plant beds.
13.	1	2	3	4	5	Apply proper amounts of lime and fertilizer based on soil test results.
14.	1	2	3	4	5	Dig drainage ditches and install drain tile.
15.	1	2	3	4	5	Install irrigation system if needed.
16.	1	2	3	4	5	Dig holes for plant setting.
17.	1	2	3	4	5	Apply pre-emergence chemicals for weed control.
18.	1	2	3	4	5	Mix the soil and soil conditioners.
19.	1	2	3	4	5	Relocate plants if needed.

no slight moderate considerable complete TASKS

Additional Tasks

1 2 3 4 5

1 2 3 4 5

C. Planting a Landscape

20. 1 2 3 4 5 Seed a lawn.

21. 1 2 3 4 5 Place sod.

22. 1 2 3 4 5 Sprig a lawn.

23. 1 2 3 4 5 Place plants in beds, trenches, and holes.

24. 1 2 3 4 5 Backfill the hole with soil mix.

25. 1 2 3 4 5 Properly water the lawn, flowers, shrubs, and trees.

26. 1 2 3 4 5 Mulch plantings with proper materials.

27. 1 2 3 4 5 Untie and groom plants.

28. 1 2 3 4 5 Support plants by guying, staking, or cabling.

29. 1 2 3 4 5 Clean up and make final inspection of landscape job.

Additional Tasks

1 2 3 4 5

1 2 3 4 5

D. Landscape Maintenance

30. 1 2 3 4 5 Clean grounds of leaves and litter.

31. 1 2 3 4 5 Identify weeds, pests, and diseases.

32. 1 2 3 4 5 Determine methods of control needed to eradicate weeds, pests, and diseases.

33. 1 2 3 4 5 Apply appropriate control measures and calibrate proper equipment.

	no	slight	moderate	considerable	complete	TASKS
D.						Landscape Maintenance (Continued)
34.	1	2	3	4	5	Follow safety precautions when administering control measures.
35.	1	2	3	4	5	Have knowledge of factors affecting control measures (wind, rain, temperature, etc.).
36.	1	2	3	4	5	Clean drainage ditches, culverts, and gutters.
	1	2	3	4	5	Prune and remove dead or unwanted plant branches.
38.	1	2	3	4	5	Scrape plant wounds.
39.	1	2	3	4	5	Apply protective substance to tree wounds or cut surfaces.
40.	1	2	3	4	5	Prune and trim trees and shrubs at the correct time using proper equipment and methods.
41.	1	2	3	4	5	Prepare lawn for reseeding.
42.	1	2	3	4	5	Reseed, sod, or sprig a lawn.
43.	1	2	3	4	5	Identify and remove poisonous plants.
44.	1	2	3	4	5	Treat plant wounds and disease infestations.
45.	1	2	3	4	5	Repair worn spots in lawn with sod or reseeding.
46.	1	2	3	4	5	Apply lime and fertilizer according to soil test.
47.	1	2	3	4	5	Water flower beds, lawns, trees, and shrubbery.
48.	1	2	3	4	5	Mow and trim lawns.
49.	1	2	3	4	5	Remove dead or unwanted trees or shrubs.
50.	1	2	3	4	5	Cultivate flower beds.
51.	1	2	3	4	5	Transplant trees and/or shrubs.
52.	1	2	3	4	5	Select and use mulches.
53.	1	2	3	4	5	Repair walkways, driveways, and patios.

	no	slight	moderate	considerable	complete	TASKS
						Additional Tasks
	1	2	3	4	5	
	1	2	3	4	5	
E.	**Propagation**					
54.	1	2	3	4	5	Select proper propagating stock.
55.	1	2	3	4	5	Propagate different types of plants at the correct time using proper techniques and procedures.
56.	1	2	3	4	5	Have knowledge of propagating structures and equipment.
57.	1	2	3	4	5	Have knowledge of propagating systems.
58.	1	2	3	4	5	Maintain and repair propagating structures and equipment.
						Additional Tasks
	1	2	3	4	5	
	1	2	3	4	5	
F.	**Greenhouse Growing of Plants**					
59.	1	2	3	4	5	Identify media materials.
60.	1	2	3	4	5	Shred or screen different media materials.
61.	1	2	3	4	5	Determine soil mix for specific plant requirements.
62.	1	2	3	4	5	Sterilize mixed soils.
63.	1	2	3	4	5	Apply correct amendments to soil mix.
64.	1	2	3	4	5	Fill benches, pots, and flats.
65.	1	2	3	4	5	Make propagation and seed sowing schedules.
66.	1	2	3	4	5	Sow seed in appropriate containers.
67.	1	2	3	4	5	Make plant cuttings and put in appropriate containers and media.

	no	slight	moderate	considerable	complete	TASKS
F.						**Greenhouse Growing of Plants** (Continued)
68.	1	2	3	4	5	Transplant seedlings to pots, flats, etc.
69.	1	2	3	4	5	Label planted specimens.
70.	1	2	3	4	5	Properly water greenhouse stock.
71.	1	2	3	4	5	Prune and thin plants.
72.	1	2	3	4	5	Fertilize plants.
73.	1	2	3	4	5	Pinch potted plants.
74.	1	2	3	4	5	Control temperature with fans and heaters.
75.	1	2	3	4	5	Control humidity with ventilating fans and humidifiers.
76.	1	2	3	4	5	Control the type and amount of light.
77.	1	2	3	4	5	Force bulbs.
78.	1	2	3	4	5	Force potted plants to bloom at seasonal times.
79.	1	2	3	4	5	Identify and control weeds with chemicals, plastic, and mechanical means.
80.	1	2	3	4	5	Fumigate greenhouse.
81.	1	2	3	4	5	Identify, remove, and destroy diseased plants.
82.	1	2	3	4	5	Control plant insects and diseases with chemicals.
83.	1	2	3	4	5	Remove plants from bed to sell.
84.	1	2	3	4	5	Select proper pot sizes for replanting plants.
						Additional Tasks
	1	2	3	4	5	
	1	2	3	4	5	

	no	slight	moderate	considerable	complete	TASKS
G.						Field Growing of Plants
85.	1	2	3	4	5	Take soil sample and interpret data.
86.	1	2	3	4	5	Calibrate spreader and apply fertilizer and lime according to soil test data.
87.	1	2	3	4	5	Plow, disk, level, and lay off rows for planting.
88.	1	2	3	4	5	Lay off and install drainage system if needed.
89.	1	2	3	4	5	Install and operate irrigation system.
90.	1	2	3	4	5	Properly plant various species of plants.
91.	1	2	3	4	5	Cultivate plants.
92.	1	2	3	4	5	Develop fertilization program for maintaining plants.
93.	1	2	3	4	5	Properly fertilize plants.
94.	1	2	3	4	5	Prune plants at proper time using appropriate methods.
95.	1	2	3	4	5	Identify weeds, pests, and diseases.
96.	1	2	3	4	5	Remove dead or undesirable stock.
97.	1	2	3	4	5	Determine methods of control needed to eradicate weeds, pests, and diseases.
98.	1	2	3	4	5	Apply appropriate control measures.
99.	1	2	3	4	5	Know factors affecting control measures (wind, rain, temperature, etc.).
100.	1	2	3	4	5	Follow all safety factors when administering control measures.
101.	1	2	3	4	5	Dig plants properly (machine or by hand).
						Additional Tasks
	1	2	3	4	5	
	1	2	3	4	5	

	no	slight	moderate	considerable	complete	TASKS
H.						Container Growing of Plants
102.	1	2	3	4	5	Select proper media and prepare media according to tests.
103.	1	2	3	4	5	Select properly sized containers.
104.	1	2	3	4	5	Sterilize media.
105.	1	2	3	4	5	Pot and repot plants properly.
106.	1	2	3	4	5	Prepare the beds including drainage system.
107.	1	2	3	4	5	Space containers properly in beds.
108.	1	2	3	4	5	Set up and maintain irrigation system.
109.	1	2	3	4	5	Operate irrigation system.
110.	1	2	3	4	5	Mulch plants properly for winter protection.
111.	1	2	3	4	5	Prune plants at proper time using appropriate methods.
112.	1	2	3	4	5	Identify weeds, pests, and diseases.
113.	1	2	3	4	5	Remove dead or undesirable stock.
114.	1	2	3	4	5	Determine methods of control needed to eradicate weeds, pests, and diseases.
115.	1	2	3	4	5	Apply appropriate control measures.
116.	1	2	3	4	5	Know factors affecting control measures (wind, rain, temperature, etc.).
117.	1	2	3	4	5	Follow all safety factors when administering control measures.
						Additional Tasks
	1	2	3	4	5	
	1	2	3	4	5	

no
slight
moderate
considerable
complete

TASKS

I. Building and Equipment Maintenance

118. 1 2 3 4 5 Keep work, storage, delivery area, display area, nursery, greenhouse, salesroom, and other facilities neat and clean.

119. 1 2 3 4 5 Clean and sharpen hand tools.

120. 1 2 3 4 5 Develop light maintenance schedule for business vehicles, tractors, lifts, and other equipment (oil, lubrication, tire pressure, battery, brake fluid, radiator, etc.).

121. 1 2 3 4 5 Tune up business vehicles, tractors, lifts, and other equipment as needed.

122. 1 2 3 4 5 Repair display cases, storage shelves, slathouses, greenhouses, storage buildings, etc.

123. 1 2 3 4 5 Maintain and repair small gas engines, dusters, sprayers, climbing equipment, etc.

124. 1 2 3 4 5 Glaze windows.

125. 1 2 3 4 5 Paint buildings, shelves, bins, etc.

126. 1 2 3 4 5 Recover greenhouses.

Additional Tasks

1 2 3 4 5

1 2 3 4 5

J. Equipment

127. 1 2 3 4 5 Operate efficiently all equipment used in the nursery (tractors, tractor implements, planting augers, plant diggers, trenchers, front-end loaders, trucks, soil mixers, potting machines, etc.).

128. 1 2 3 4 5 Follow safety precautions for all equipment.

129. 1 2 3 4 5 Determine appropriate equipment to use for various jobs.

130. 1 2 3 4 5 Make minor changes to agricultural and industrial equipment to adopt it to the nursery operation.

no
slight
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complete

TASKS

J. Equipment (Continued)

131. 1 2 3 4 5 Make minor equipment repairs.

Additional Tasks

1 2 3 4 5

1 2 3 4 5

K. Construction

132. 1 2 3 4 5 Apply basic carpentry skills in building display beds, slathouses, storage sheds, greenhouses, and other construction projects.

133. 1 2 3 4 5 Install fences using different types of materials.

134. 1 2 3 4 5 Install walls using railroad ties, block, brick, rock, or other materials.

135. 1 2 3 4 5 Construct planters.

136. 1 2 3 4 5 Construct garden bench seats.

137. 1 2 3 4 5 Install walks and patios using brick, concrete, and other materials.

138. 1 2 3 4 5 Erect suitable lighting for recreation and garden areas.

139. 1 2 3 4 5 Install proper edging for various landscape areas.

140. 1 2 3 4 5 Construct rock gardens and other specialized areas.

Additional Tasks

1 2 3 4 5

1 2 3 4 5

L. Advertising and Selling Plants

141. 1 2 3 4 5 Advertise products effectively through newspapers, magazines, sales leaflets, radio, television, store displays, special displays, etc.

142. 1 2 3 4 5 Use supplier advertising materials effectively.

	no	slight	moderate	considerable	complete	TASKS
L.						Advertising and Selling Plants((Continued)
143.	1	2	3	4	5	Identify customer needs and wants.
144.	1	2	3	4	5	Describe to customers the purposes and qualities of merchandise for sale.
145.	1	2	3	4	5	Take orders for sales or service by telephone.
146.	1	2	3	4	5	Quote cost of plants.
147.	1	2	3	4	5	Make cost estimates on customer orders.
148.	1	2	3	4	5	Use effective interpersonal relationships in dealing with customers.
149.	1	2	3	4	5	Label and price mark merchandise.
150.	1	2	3	4	5	Display store merchandise for sale.
151.	1	2	3	4	5	Wrap and/or package merchandise sold.
152.	1	2	3	4	5	Deliver or ship merchandise sold.
153.	1	2	3	4	5	Rent equipment to customers.
154.	1	2	3	4	5	Follow up sales to determine customer satisfaction.
155.	1	2	3	4	5	Prepare and keep current price lists and sales catalogs.
156.	1	2	3	4	5	Suggest to customer plant materials to be used under their situations.
157.	1	2	3	4	5	Read and interpret landscape plans drawn by designers and architects.
158.	1	2	3	4	5	Develop and verify customer directories.
159.	1	2	3	4	5	Use cash register, adding machine, calculator, and other recording devices.
160.	1	2	3	4	5	Advise customers on fertilization, disease, and insect control using current information.
161.	1	2	3	4	5	Answer customer complaints.
162.	1	2	3	4	5	Write up customer orders.

	no	slight	moderate	considerable	complete	TASKS
L.						Advertising and Selling Plants (Continued)
163.	1	2	3	4	5	Water and properly care for plants on display and/or storage.
164.	1	2	3	4	5	Repair or reball balled and burlapped plants.
165.	1	2	3	4	5	Properly handle and load carts, trailers, trucks, or other vehicles for transportation of plants within the nursery and to delivery points.
						Additional Tasks
	1	2	3	4	5	
	1	2	3	4	5	
M.						Records
166.	1	2	3	4	5	Take periodic inventory.
167.	1	2	3	4	5	Keep records of receipts and expenses.
168.	1	2	3	4	5	Prepare and mail bills to collect accounts due.
169.	1	2	3	4	5	Keep employee work records.
170.	1	2	3	4	5	Prepare employee payroll.
171.	1	2	3	4	5	Assist in records audit.
172.	1	2	3	4	5	Prepare income tax and other necessary reports.
173.	1	2	3	4	5	Keep annual depreciation schedule.
174.	1	2	3	4	5	Develop customer credit records.
175.	1	2	3	4	5	File records and other materials.
176.	1	2	3	4	5	Develop adequate record system for ordering and restocking plants and materials, pricing, determining quantities for production, and for profit analysis.
177.	1	2	3	4	5	Keep maintenance and repair records on equipment.
						Additional Tasks
	1	2	3	4	5	
	1	2	3	4	5	

no slight moderate considerable complete

TASKS

N. Inventory

178. 1 2 3 4 5 Keep current inventory of merchandise for sale.

179. 1 2 3 4 5 Check received merchandise against invoice listings.

180. 1 2 3 4 5 Check invoices for errors.

181. 1 2 3 4 5 Store received merchandise.

182. 1 2 3 4 5 Order replacement and/or new merchandise.

183. 1 2 3 4 5 Arrange for transportation of materials purchased.

184. 1 2 3 4 5 Order repair parts for business vehicles and equipment.

Additional Tasks

1 2 3 4 5

1 2 3 4 5

O. Management

185. 1 2 3 4 5 Identify labor needs.

186. 1 2 3 4 5 Determine types and amount of equipment to buy and stock.

187. 1 2 3 4 5 Identify and select producers and suppliers of plants, equipment, supplies, etc.

188. 1 2 3 4 5 Select and purchase equipment, supplies, etc.

189. 1 2 3 4 5 Enforce safety regulations.

190. 1 2 3 4 5 Recruit and select employees.

191. 1 2 3 4 5 Train employees.

192. 1 2 3 4 5 Designate employee work assignments.

193. 1 2 3 4 5 Supervise employees.

194. 1 2 3 4 5 Evaluate employee performance.

	no slight moderate considerable complete	TASKS
0.	**Management** (Continued)	
195.	1 2 3 4 5	Perform personnel actions such as promoting, firing, disciplinary action, etc.
196.	1 2 3 4 5	Establish employee wages, hours, and working conditions.
197.	1 2 3 4 5	Administer social security and other employee benefit programs.
198.	1 2 3 4 5	Knowledge of business laws, taxes, and laws pertaining to hiring, paying, and treating employees.
199.	1 2 3 4 5	Analyze new products and plants to determine if they need to be added to the sales line.
200.	1 2 3 4 5	Analyze current market trends and expansion possibilities.
201.	1 2 3 4 5	Determine need for, select reputable insurer, and purchase comprehensive business insurance.
202.	1 2 3 4 5	Estimate costs of projects and make proper bids.
203.	1 2 3 4 5	Carry out or implement landscape design plans.
204.	1 2 3 4 5	Determine appropriate plant replacements if specified plants are not available in landscape plan.
205.	1 2 3 4 5	Determine business credit needs.
206.	1 2 3 4 5	Locate sources of and secure credit.
207.	1 2 3 4 5	Prepare, negotiate, and implement sales contracts.
208.	1 2 3 4 5	Allocate monies in preparing budget.
209.	1 2 3 4 5	Analyze business enterprises on cost and return basis.
210.	1 2 3 4 5	Arrange trade-ins and credit terms.
211.	1 2 3 4 5	Check credit references of customers.
		Additional Tasks
	1 2 3 4 5	
	1 2 3 4 5	

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TASKS

P. **Designing a Landscape**

212. 1 2 3 4 5 Identify and use drafting equipment.

213. 1 2 3 4 5 Develop knowledge of landscape symbols.

214. 1 2 3 4 5 Key and letter a drawing.

215. 1 2 3 4 5 Consult with client to determine his needs and wishes.

216. 1 2 3 4 5 Survey the landscape area.

217. 1 2 3 4 5 Locate existing water and sewer lines in landscape areas.

218. 1 2 3 4 5 Develop landscape design by using principles and techniques that fit the job.

219. 1 2 3 4 5 Select appropriate plant materials for the design.

220. 1 2 3 4 5 Estimate labor in terms of numbers of men and hours.

221. 1 2 3 4 5 Prepare cost estimate of plan.

Additional Tasks

1 2 3 4 5

1 2 3 4 5

Q. **Professional Improvement**

222. 1 2 3 4 5 Be familiar with various professional and trade assocations and make decision about membership in these organizations.

223. 1 2 3 4 5 Be aware of how and where to find current information on plant diseases, pesticides, new plants and varieties, insects, equipment, etc.

224. 1 2 3 4 5 Have knowledge of and subscribe to various professional and trade publications.

Additional Tasks

1 2 3 4 5

1 2 3 4 5

PLEASE RESPOND TO EACH OF THE FOLLOWING QUESTIONS:

1. Are you a:

A. _______ Owner of nursery or other horticulture enterprise
B. _______ Manager of nursery or other horticulture enterprise
C. _______ Employee in a horticulture enterprise
D. _______ Horticulture instructor

2. Number of years of experience in your current employment:

A. _______ 0-4
B. _______ 5-9
C. _______ 10-14
D. _______ 15-19
E. _______ 20-24
F. _______ 25-29
G. _______ 30 or above

3. Your present age is:

A. _______ 18-24
B. _______ 25-34
C. _______ 35-44
D. _______ 45-54
E. _______ 55-64
F. _______ 64 or older

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APPENDIX C-3

TASK VALIDATION RESULTS

Orig. No.	Rank	TASKS	Total No. Responses ( )	MEAN Group	MEAN Emplyr's	(N)	MEAN Emplye's	(N)	MEAN Educ's	(N)	FREQUENCY (N) & PCT. OF FREQUENCY (ADJ.) 1 (N)	1 Pct.	2 (N)	2 Pct.	3 (N)	3 Pct.	4 (N)	4 Pct.	5 (N)	5 Pct.
D34	1	Follow all safety precautions when administering control measures.	60	4.55	4.8	25	4.35	20	4.5	12	0	0	2	3.3	2	3.3	13	21.7	43	71.6
P219	2	Select appropriate plant materials for the design.	60	4.51	4.6	25	4.35	20	4.55	12	1	1.6	0	0	1	1.6	23	38.3	35	58.3
G100	3	Follow all safety factors when administering control measures.	56	4.4	4.6	25	4.05	19	4.56	9	1	1.8	2	3.6	1	1.8	19	33.9	33	58.9
H117	4	Follow all safety factors when administering control measures.	57	4.39	4.5	24	4.26	19	4.42	12	1	1.8	0	0	6	10.5	16	28.1	34	59.6
B5	5	Select proper planting site for different types of plants.	61	4.38	4.4	26	4.4	20	4.33	12	0	0	1	1.6	3	4.9	26	42.6	30	49.2
D32	5	Determine methods of control needed to eradicate weeds, pests, and diseases.	60	4.38	4.3	25	4.35	20	4.5	12	0	0	1	1.6	3	5	28	46.6	28	46.6
A3	7	Determine cultural requirements of plants (light, soil, moisture, temperature, etc.).	61	4.35	4.1	26	4.45	20	4.5	12	0	0	1	1.6	6	9.8	26	42.6	28	45.9
G93	7	Properly fertilize plants.	59	4.35	4.4	25	4.3	20	4.36	11	0	0	1	1.7	3	5.1	29	49.2	26	44.1
Q223	9	Be aware of how and where to find current information on plant diseases, pesticides, new plants and varieties, insects, equipment, etc.	60	4.33	4.2	25	4.3	20	4.5	12	0	0	1	1.6	7	11.7	24	40	28	46.6
E55	10	Propagate different types of plants at the correct time using proper techniques and procedures.	61	4.32	4.5	26	3.95	20	4.5	12	4	6.5	0	0	4	6.5	18	29.5	35	57.4
F72	10	Fertilize plants.	59	4.32	4.3	24	4.15	20	4.5	12	3	5.1	0	0	0	0	28	47.4	28	47.4
J128	10	Follow safety precautions for all equipment.	61	4.32	4.5	26	4.05	20	4.42	12	1	1.6	1	1.6	7	11.5	17	27.9	35	57.4
P221	10	Prepare cost estimate of plan.	60	4.32	4.5	25	4.2	20	4.25	12	1	1.6	0	0	6	10	23	38.3	30	50
P215	14	Consult with client to determine his needs and wishes.	59	4.3	4.3	25	4.25	20	4.36	11	1	1.7	1	1.7	5	8.5	24	40.7	28	47.4
B13	15	Apply proper amounts of lime and fertilizer based on soil test results.	61	4.29	4.5	26	3.95	20	4.42	12	0	0	3	4.9	7	11.5	18	29.5	33	54.1
C29	15	Clean up and make final inspection of landscape job.	58	4.29	4.5	26	4.12	19	4.27	11	1	1.7	0	0	8	13.7	20	34.5	29	50
F70	15	Properly water greenhouse stock.	59	4.27	4.3	24	4	20	4.58	12	3	5.1	0	0	6	10.2	18	30.5	32	54.2

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Orig. No.	Rank	TASKS	Total No. Responses ( )	MEAN							FREQUENCY (N) & PCT. OF FREQUENCY (ADJ.)									
				Group	Emplyr's	(N)	Emplye's	(N)	Educ's	(N)	1 (N)	1 Pct.	2 (N)	2 Pct.	3 (N)	3 Pct.	4 (N)	4 Pct.	5 (N)	5 Pct.
D33	18	Apply appropriate control measures and calibrate proper equipment.	60	4.28	4.3	25	4.3	20	4.25	12	0	0	0	0	8	13.3	25	41.6	27	45
H114	18	Determine methods of control needed to eradicate weeds, pests, and diseases.	60	4.28	4.2	25	4.15	20	4.5	12	1	1.6	0	0	7	11.7	25	41.7	27	45
D31	20	Identify weeds, pests, and diseases.	60	4.26	4.1	25	4.35	20	4.3	12	1	1.6	1	1.6	5	8.3	27	45	26	43.3
E54	20	Select proper propagating stock.	60	4.26	4.4	26	4.05	19	4.33	12	2	3.3	1	1.6	5	8.3	23	38.3	29	48.3
P218	20	Develop landscape design by using principles and techniques that fit the job.	60	4.26	4.4	25	3.95	20	4.42	12	1	1.6	0	0	7	11.7	25	41.7	27	45
G95	23	Identify weeds, pests, and diseases.	59	4.25	4	25	4.3	20	4.46	11	0	0	1	1.7	7	11.8	29	49.2	22	37.3
F82	24	Control plant insects and diseases with chemicals.	59	4.23	4.1	24	4.25	20	4.33	12	3	5.1	1	1.7	5	8.5	21	35.6	29	49.1
P220	24	Estimate labor in terms of numbers of men and hours.	58	4.23	4.4	25	4.11	19	4.18	11	1	1.7	0	0	9	15.5	19	32.8	29	50
G98	26	Apply appropriate control measures.	58	4.22	4.2	25	4	19	4.46	11	1	1.7	2	3.4	5	8.6	27	46.5	23	39.6
I118	27	Keep work, storage, delivery area, display area, nursery, greenhouse, salesroom, and other facilities neat and clean.	59	4.21	4.2	25	4.26	19	4.17	12	0	0	2	3.4	13	22	15	25.4	29	49.2
G94	28	Prune plants at proper time using appropriate methods.	59	4.21	4.1	25	4.25	20	4.27	11	0	0	2	3.4	8	13.5	25	42.4	24	40.7
H115	28	Apply appropriate control measures.	60	4.21	4.2	25	4	20	4.42	12	1	1.6	1	1.6	6	10	27	45	25	41.7
O189	30	Enforce safety regulations.	59	4.2	4.5	25	4	20	4.09	11	1	1.7	1	1.7	9	15.3	18	30.5	30	50.8
D35	31	Have knowledge of factors affecting control measures (wind, rain, temperature, etc.).	60	4.19	4.3	25	4.2	20	4.08	12	0	0	1	1.6	6	10	30	50	23	38.3
B4	32	Determine time of year to plant various species.	61	4.18	4.1	26	4.2	20	4.25	12	0	0	2	3.2	9	14.8	25	41	25	41
D51	32	Transplant trees and/or shrubs.	60	4.18	4.1	25	4.1	20	4.33	12	0	0	1	1.6	11	18.3	24	40	24	40
G101	34	Dig plants properly (machine or by hand).	56	4.17	4.3	25	3.9	19	4.3	10	1	1.8	3	5.4	9	16.1	16	28.6	27	48.2
B9	35	Take soil sample and interpret results.	61	4.16	3.9	26	4.1	20	4.5	12	0	0	4	6.5	8	13.1	26	42.6	23	37.7
C25	35	Properly water the lawn, flowers, shrubs, and trees.	61	4.16	4.3	26	3.85	20	4.33	12	1	1.6	1	1.6	9	14.8	26	42.6	24	39.3
L157	35	[illegible] and interpret landscape plans drawn [illegible]signers and architects.	60	4.16	4.4	[illegible]	4.15	20	3.92	12	3	5	1	1.6	5	8.3	22	[illegible]	[illegible]	48.3

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Orig. No.	Rank	TASKS	Total No. Responses ( )	MEAN Group	Emplyr's	(N)	Emplye's	(N)	Educ's	(N)	FREQUENCY (N) & PCT. OF FREQUENCY (ADJ.) 1 (N)	1 Pct.	2 (N)	2 Pct.	3 (N)	3 Pct.	4 (N)	4 Pct.	5 (N)	5 Pct.
C26	57	Mulch plantings with proper materials.	61	4.05	4.2	26	3.8	20	4.17	12	1	1.6	1	1.6	13	21.3	22	36.1	24	39.3
G86	57	Calibrate spreader and apply fertilizer and lime according to soil test data.	59	4.05	4.2	24	3.7	20	4.25	12	1	1.7	4	6.7	8	13.5	25	42.4	21	35.6
0192	57	Designate employee work assignments.	60	4.05	4.4	25	4	20	3.75	12	0	0	4	6.6	11	18.3	18	30	27	45
Q223	57	Have knowledge of and subscribe to various professional and trade publications.	60	4.05	3.9	25	4	20	4.25	12	1	1.6	2	3.3	14	23.3	19	31.6	19	31.6
D47	63	Water flower beds, lawns, trees, and shrubbery.	60	4.04	4.1	25	3.6	20	4.42	12	0	0	4	6.6	13	21.7	22	36.6	21	35
F84	63	Select proper pot sizes for replanting plants.	54	4.04	4.7	24	3.33	18	4.1	10	4	7.4	4	7.4	13	24.1	20	37	13	24.1
P214	63	Key and letter a drawing.	60	4.04	4.1	25	3.95	20	4.08	12	1	1.6	2	3.3	8	13.3	30	50	19	31.6
F63	66	Apply correct amendments to soil mix.	59	4.03	4	24	3.75	20	4.3	12	3	5.1	2	3.4	7	11.8	26	44.1	21	35.6
G92	66	Develop fertilization program for maintaining plants.	59	4.03	4.1	25	3.8	20	4.18	11	1	1.7	2	3.4	9	15.3	28	47.4	19	32.2
0194	66	Evaluate employee performance.	60	4.03	4.2	25	4.15	20	3.75	12	1	1.6	2	3.3	17	28.3	11	18.3	29	48.3
P217	66	Locate existing water and sewer lines in landscape areas.	60	4.03	4.2	25	3.8	20	4.08	12	2	3.3	2	3.3	7	11.7	28	46.6	21	35
F69	70	Label planted specimens.	59	4.02	3.9	24	3.75	20	4.42	12	4	6.7	4	6.7	6	10.2	18	30.5	27	45.7
J129	70	Determine appropriate equipment use for various jobs.	61	4.02	4.2	26	3.6	20	4.25	12	2	3.2	1	1.6	11	18	29	47.5	18	29.5
0191	70	Train employees.	60	4.02	4.3	25	3.85	20	3.92	12	1	1.6	1	1.6	13	21.7	23	38.3	22	36.6
D52	73	Select and use mulches.	58	4.01	4.2	25	3.74	19	4.09	11	0	0	2	3.4	13	22.4	22	37.9	21	36.2
L160	73	Advise customers on fertilization, disease and insect control using current information.	60	4.01	4.4	25	3.95	20	3.67	12	3	5	4	6.6	7	11.7	18	30	28	46.6
L163	73	Water and properly care for plants on display and/or storage.	59	4.01	4	24	3.95	20	4.08	12	4	6.7	3	5.1	8	13.5	17	28.8	27	45.7
P213	73	Develop knowledge of landscape symbols.	59	4.01	4.1	25	3.84	19	4.08	12	1	1.7	1	1.7	11	18.6	28	47.4	18	30.5
B18	77	Mix the soil and soil conditioners.	59	4	4.1	25	3.47	19	4.42	12	0	0	6	10.2	11	18.6	20	33.8	22	37.3
G99	77	Know factors affecting control measures (wind, rain, temperature, etc.).	58	4	4.1	25	3.9	20	4	10	2	3.4	1	1.7	11	18.9	22	37.9	22	37.9

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Orig. No.	Rank	TASKS	Total No. Responses ( )	MEAN Group	Emplyr's	(N)	Emplye's	(N)	Educ's	(N)	1 (N)	1 Pct.	2 (N)	2 Pct.	3 (N)	3 Pct.	4 (N)	4 Pct.	5 (N)	5 Pct.
											FREQUENCY (N) & PCT. OF FREQUENCY (ADJ.)									
0203	38	Carry out or implement landscape design plans.	60	4.15	4.4	25	4.05	20	4	12	1	1.6	1	1.6	11	18.3	18	30	29	48.3
G97	39	Determine methods of control needed to eradicate weeds, pests, and diseases.	59	4.14	4.2	25	3.95	20	4.27	11	1	1.7	2	3.4	12	20.3	17	28.8	27	45.7
H112	39	Identify weeds, pests, and diseases.	60	4.14	4	25	4.25	20	4.17	12	1	1.6	0	0	10	16.6	27	45	22	36.6
P216	39	Survey the landscape area.	59	4.14	4.2	25	4.05	20	4.18	11	1	1.7	2	3.4	9	15.3	22	37.3	25	42.4
F67	42	Make plant cuttings and put in appropriate containers and media.	59	4.13	4.2	24	3.85	20	4.3	12	4	6.7	0	0	4	6.7	30	50.8	21	35.6
D46	43	Apply lime and fertilizer according to soil test.	60	4.12	4.1	25	3.75	20	4.5	12	1	1.6	1	1.6	9	15	30	50	19	31.6
0193	43	Supervise employees.	60	4.12	4.3	25	4.15	20	3.92	12	0	0	3	5	12	20	16	26.6	29	48.3
A1	45	Identify plants by common and scientific name (annuals, biennials, perennials, etc.).	60	4.11	4.2	26	4.05	19	4.08	12	0	0	1	1.6	8	13.3	37	61.6	14	23.3
B11	45	Prepare flower and shrub beds for planting.	61	4.11	4.2	26	3.7	20	4.42	12	1	1.6	1	1.6	12	19.6	28	45.9	19	31.1
D40	45	Prune and trim trees and shrubs at the correct time using proper equipment and methods.	60	4.11	4	25	4	20	4.33	12	2	3.3	2	3.3	9	15	23	38.3	24	40
G85	45	Take soil sample and interpret data.	57	4.11	3.9	24	4	18	4.42	12	0	0	3	5.3	6	10.5	31	54.4	17	29.8
G90	45	Properly plant various species of plants.	58	4.11	4.2	24	3.95	20	4.18	11	0	0	4	6.9	6	10.3	28	48.3	20	34.5
H111	45	Prune plants at proper time using appropriate methods.	60	4.11	4.2	25	3.8	20	4.33	12	2	3.3	1	1.6	9	15	25	41.7	23	38.3
H116	45	Know factors affecting control measures (wind, rain, temperature, etc.).	60	4.11	4.2	25	3.95	20	4.17	12	1	1.6	2	3.3	9	15	23	38.3	25	41.7
F61	52	Determine soil mix for specific plant requirements.	59	4.09	4.2	24	3.75	20	4.33	12	3	5.1	2	3.4	5	8.5	27	45.7	22	37.3
L156	53	Suggest to customer plant materials to be used under their situations.	60	4.07	4.1	25	4.1	20	4	12	3	5	1	1.6	10	16.6	19	31.6	27	45
0185	53	Identify labor needs.	55	4.07	4.2	25	4.18	17	3.82	11	0	0	3	5.5	9	16.4	19	34.5	24	43.6
F74	55	Control temperature with fans and heaters.	59	4.06	4	24	3.85	20	4.33	12	3	5.1	1	1.7	10	16.9	20	33.8	25	42.4
H110	55	Mulch plants properly for winter protection.	59	4.06	4.2	25	3.8	20	4.18	11	2	3.4	1	1.7	10	16.9	23	38.9	23	38.9
B6	57	Lay out space requirements.	61	4.05	3.9	26	4	20	4.25	12	0	0	1	1.6	14	22.9	27	44.3	19	31.1
B16	57	[illegible] oles for plant setting.	61	4.05	4	[illegible]	3.65	20	4.5	12	0	0	8	13.1	9	14.8	19	[illegible]	25	41

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Orig. No.	Rank	TASKS	Total No. Responses ( )	MEAN							FREQUENCY (N) & PCT. OF FREQUENCY (ADJ.)									
				Group	Emplyr's	(N)	Emplye's	(N)	Educ's	(N)	1 (N)	1 Pct.	2 (N)	2 Pct.	3 (N)	3 Pct.	4 (N)	4 Pct.	5 (N)	5 Pct.
C20	79	Seed a lawn.	59	3.99	4.1	25	3.7	20	4.18	11	1	1.7	3	5.1	9	15.3	28	47.4	18	30.5
D37	79	Prune and remove dead or unwanted plant branches.	60	3.99	4.2	25	3.6	20	4.17	12	1	1.6	4	6.6	9	15	27	45	19	31.6
E57	79	Have knowledge of propagating systems.	59	3.99	4.1	26	3.68	19	4.18	11	4	6.7	1	1.7	9	15.3	24	40.6	21	35.6
F80	79	Fumigate greenhouse.	59	3.99	4	24	3.9	20	4.08	12	4	6.7	0	0	10	16.9	22	37.3	23	38.9
D204	79	Determine appropriate plant replacements if specified plants are not available in landscape plan.	59	3.99	4.4	25	3.75	20	3.82	11	1	1.7	2	3.4	9	15.3	27	45.7	20	33.8
B17	84	Apply pre-emergency chemicals for weed control.	61	3.97	4.1	26	3.8	20	4	12	1	1.6	5	8.2	12	19.6	18	29.5	25	41
E56	84	Have knowledge of propagating structures and equipment.	61	3.97	4	26	3.65	20	4.25	12	4	6.5	0	0	12	19.6	26	42.6	19	31.1
F59	84	Identify media materials.	58	3.97	3.8	24	3.79	19	4.33	12	2	3.4	2	3.4	11	18.9	25	43.1	18	31
F73	84	Pinch potted plants.	59	3.97	3.8	24	3.7	20	4.42	12	5	8.5	2	3.4	8	13.5	21	35.6	23	38.9
L148	84	Use effective interpersonal relationships in dealing with customers.	59	3.97	4.2	24	3.95	20	3.75	12	4	6.7	1	1.7	10	16.9	18	30.5	26	44.1
F65	89	Make propagation and seed sowing schedules.	59	3.96	4.3	24	3.6	20	4	12	3	5.1	3	5.1	6	10.2	26	44.1	21	35.6
F79	89	Identify and control weeds with chemicals, plastic, and mechanical means.	59	3.96	4.1	24	3.45	20	4.33	12	4	6.7	0	0	11	18.6	24	40.7	20	33.8
H109	91	Operate irrigation system.	59	3.95	3.9	25	3.85	20	4.09	11	2	3.4	0	0	17	28.8	21	35.6	19	32.2
F75	92	Control humidity with ventilating fans and humidifiers.	59	3.94	4	24	3.75	20	4.08	12	3	5.1	1	1.7	13	22	21	35.6	21	35.6
H102	92	Select proper media and prepare media according to soil tests.	57	3.94	4.1	25	3.71	17	4	12	2	3.5	1	1.8	13	22.8	22	38.6	19	33.3
C23	94	Place plants in beds, trenches, and holes.	61	3.93	3.9	26	3.55	20	4.33	12	1	1.6	4	6.5	14	22.9	23	37.7	19	31.1
F66	95	Sow seed in appropriate containers.	59	3.92	4	24	3.75	20	4	12	3	5.1	3	5.1	11	18.6	23	38.9	19	32.2
H105	95	Pot and repot plants properly.	60	3.92	3.8	25	3.7	20	4.25	12	3	5	2	3.3	9	15	27	45	18	30
L147	95	Make cost estimates on customer orders.	59	3.92	4.2	24	3.9	20	3.67	12	4	6.7	3	5.1	10	16.9	15	25.4	27	45.7
L161	95	Answer customer complaints.	59	3.92	4	24	4.1	20	3.67	12	2	3.4	3	5.1	10	16.9	21	35.6	23	38.9
H108	99	Set up and maintain irrigation system.	60	3.91	3.9	25	3.9	20	3.92	12	2	3.3	1	1.6	16	26.6	22	36.6	19	31.6

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Orig. No.	Rank	TASKS	Total No. Responses ( )	MEAN Group	Emplyr's	(N)	Emplye's	(N)	Educ's	(N)	FREQUENCY (N) & PCT. OF FREQUENCY (ADJ.) 1 (N)	1 Pct.	2 (N)	2 Pct.	3 (N)	3 Pct.	4 (N)	4 Pct.	5 (N)	5 Pct.
C27	100	Untie and groom plants.	61	3.89	4	26	3.6	20	4.08	12	1	1.6	1	1.6	21	34.4	20	32.8	18	29.5
H103	100	Select properly sized containers.	60	3.89	4	25	3.6	20	4.08	12	3	5	3	5	10	16.6	25	41.7	19	31.6
H106	100	Prepare the beds including drainage system.	60	3.89	3.9	25	3.7	20	4.08	12	3	5	2	3.3	15	25	20	33.3	20	33.3
H107	100	Space containers properly in beds.	60	3.89	3.8	25	3.7	20	4.17	12	3	5	1	1.6	16	26.6	21	35	19	31.6
L144	100	Describe to customers the purposes and qualities of merchandise for sale.	60	3.89	4.1	25	3.9	20	3.67	12	4	6.6	3	5	7	11.7	22	36.6	24	40
P212	100	Identify and use drafting equipment.	58	3.89	3.9	25	3.69	16	4.09	11	2	3.4	3	5.2	11	19	20	34.5	17	29.3
0186	106	Determine types and amount of equipment to buy and stock.	60	3.88	3.9	25	4	20	3.75	12	1	1.6	5	8.3	14	23.3	18	30	22	36.6
A2	107	Use resource material to identify unknown plants which cannot be identified by visual inspection.	61	3.88	3.6	26	4.3	20	3.75	12	2	3.2	3	4.9	14	22.9	20	32.8	22	36.1
B19	107	Relocate plants if needed.	59	3.88	4	26	3.47	19	4.17	12	2	3.4	2	3.4	14	23.7	27	45.7	14	23.7
F71	107	Prune and thin plants.	59	3.88	3.9	24	3.5	20	4.25	12	3	5.1	3	5.1	11	18.6	24	40.7	18	30.5
F76	107	Control the type and amount of light.	59	3.88	4	24	3.55	20	4.08	12	4	6.7	3	5.1	9	15.3	22	37.3	21	35.6
J127	107	Operate efficiently all equipment used in the nursery (tractors, tractor implements, planting augers, plant diggers, trenchers, front-end loaders, trucks, soil mixers, potting machines, etc.).	60	3.88	3.9	26	3.74	19	4	12	0	0	6	10	13	21.7	21	35	20	33.3
F68	112	Transplant seedlings to pots, flats, etc.	58	3.87	3.8	24	3.63	19	4.17	12	3	5.2	4	6.9	11	18.9	22	37.9	18	31
F83	112	Remove plants from bed to sell.	56	3.87	4.5	24	3.21	19	3.9	10	6	10.7	4	7.1	14	25	21	37.5	11	19.6
0190	112	Recruit and select employees.	60	3.87	4.1	25	4	20	3.5	12	0	0	6	10	11	18.3	22	36.6	21	35
0187	115	Identify and select producers and suppliers of plants, equipment, supplies, etc.	60	3.86	4.1	25	3.8	20	3.67	12	1	1.6	4	6.6	11	18.3	26	43.3	18	30
Q222	115	Be familiar with various professional and trade assocations and make decisions about membership in these organizations.	58	3.86	3.7	25	3.8	20	4.08	12	1	1.7	3	5.2	16	27.6	22	37.9	16	27.6
F81	117	Identify, remove, and destroy diseased plants.	59	3.84	4	24	3.6	20	3.92	12	4	6.7	2	3.4	12	20.3	21	35.6	20	33.8
L149	117	Label and price mark merchandise.	59	3.84	4	24	4.1	20	3.42	12	3	5.1	3	5.1	11	18.6	21	35.6	21	35.6
0202	117	[illegible]ate costs of projects and make proper bids.	60	3.84	4.3	[illegible]	3.55	20	3.67	12	3	5	5	8.3	7	11.7	22	[illegible]	[illegible]	38.3

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Orig. No.	Rank	TASKS	Total No. Responses ( )	MEAN							FREQUENCY (N) & PCT. OF FREQUENCY (ADJ.)									
				Group	Emplyr's	(N)	Emplye's	(N)	Educ's	(N)	1 (N)	1 Pct.	2 (N)	2 Pct.	3 (N)	3 Pct.	4 (N)	4 Pct.	5 (N)	5 Pct.
G91	120	Cultivate plants.	59	3.83	3.6	25	3.8	20	4.09	11	0	0	8	13.5	12	20.3	23	38.9	16	27.1
L143	121	Identify customer needs and wants.	60	3.82	4	25	3.8	20	3.67	12	3	5	2	3.3	11	18.3	25	41.7	19	31.6
C28	122	Support plants by guying, staking, or cabling.	59	3.81	3.9	26	3.53	19	4	11	2	3.4	0	0	22	37.3	17	28.8	18	30.5
O188	122	Select and purchase equipment, supplies, etc.	59	3.81	3.9	25	3.9	20	3.64	11	1	1.7	3	5.1	14	23.7	25	42.4	16	27.1
L162	124	Write up customer orders.	59	3.8	4.1	24	3.8	20	3.5	12	3	5.1	3	5.1	14	23.7	17	28.8	22	37.3
D44	125	Treat plant wounds and disease infestations.	60	3.79	3.9	25	3.55	20	3.92	12	1	1.6	3	5	18	30	23	38.3	15	25
H104	126	Sterilize media.	60	3.78	3.6	25	3.5	20	4.25	12	4	6.6	3	5	17	28.3	18	30	18	30
L146	126	Quote cost of plants.	59	3.78	3.9	24	3.85	20	3.58	12	5	8.5	2	3.4	8	13.5	27	45.7	17	28.8
O195	128	Perform personnel actions such as promoting, firing, disciplinary action, etc.	60	3.75	4	25	3.75	20	3.5	12	2	3.3	10	16.6	9	15	16	26.6	23	38.3
H113	129	Remove dead or undesirable stock.	60	3.73	3.6	25	3.6	20	4	12	3	5	3	5	20	33.3	16	26.6	18	30
L165	130	Properly handle and load carts, trailers, trucks, or other vehicles for transportation of plants within the nursery and to delivery points.	52	3.72	3.9	22	3.16	19	4.11	9	2	3.8	6	11.5	16	30.8	13	25	15	28.8
D41	131	Prepare lawn for reseeding.	60	3.72	3.8	25	3.45	20	3.92	12	2	3.3	3	5	18	30	24	40	13	21.7
F62	132	Sterilize mixed soils.	59	3.71	3.6	24	3.45	20	4.08	12	4	6.7	7	11.8	10	16.9	20	33.8	18	30.5
M180	132	Check invoices for errors.	59	3.71	4	24	3.8	20	3.33	12	2	3.4	9	15.3	8	13.5	19	32.2	21	35.6
M167	134	Keep records of receipts and expenses.	59	3.7	4	24	3.85	20	3.25	12	1	1.7	8	13.5	13	22	16	27.1	21	35.6
L164	135	Repair or reball balled and burlapped plants.	58	3.7	3.8	24	3.47	19	3.83	12	3	5.2	7	12.1	13	22.4	15	25.9	20	34.5
M177	136	Keep maintenance and repair records on equipment.	56	3.69	3.9	24	3.53	19	3.64	11	1	1.8	8	14.3	8	14.3	27	48.2	12	21.4
C21	137	Place sod.	59	3.68	3.6	25	3.45	20	4	11	1	1.7	6	10.2	18	30.5	21	35.6	13	22
I119	137	Clean and sharpen hand tools.	60	3.68	3.7	25	3.6	20	3.75	12	1	1.6	4	6.5	20	33.3	19	31.6	14	23.3
L145	137	Take orders for sales or service by telephone.	59	3.68	3.8	24	3.75	20	3.5	12	4	6.7	4	6.7	11	18.6	26	44.1	14	23.7
M166	140	Take periodic inventory.	56	3.67	3.6	24	3.95	19	3.46	11	0	0	5	8.9	21	37.5	14	25	16	28.6

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Orig. No.	Rank	TASKS	Total No. Responses ( )	MEAN							FREQUENCY (N) & PCT. OF FREQUENCY (ADJ.)									
				Group	Emplyr's	(N)	Emplye's	(N)	Educ's	(N)	1 (N)	1 Pct.	2 (N)	2 Pct.	3 (N)	3 Pct.	4 (N)	4 Pct.	5 (N)	5 Pct.
L159	141	Use cash register, adding machine, calculator and other recording devices.	59	3.67	3.8	24	3.8	20	3.42	12	3	5.1	5	8.5	8	13.5	18	30.5	26	44.1
C24	142	Backfill the hole with soil mix.	61	3.66	3.9	26	3.35	20	3.75	12	3	4.9	5	8.2	17	27.9	19	31.1	17	27.9
D42	143	Reseed, sod, or sprig a lawn.	59	3.65	3.6	25	3.45	20	3.91	11	2	3.4	3	5.1	18	30.5	26	44.1	10	16.9
G89	143	Install and operate irrigation system.	58	3.65	3.7	24	3.7	20	3.55	11	1	1.7	7	12.1	16	27.6	19	32.7	25	43.1
L155	143	Prepare and keep current price lists and sales catalogs.	59	3.65	3.5	24	3.95	20	3.5	12	4	6.7	8	13.5	9	15.3	22	37.3	16	27.1
M182	146	Order replacement and/or new merchandise.	58	3.64	3.7	24	3.75	20	3.46	11	2	3.4	7	12.1	14	24.1	18	31	17	29.3
G88	147	Lay off and install drainage system if needed.	58	3.63	3.8	24	3.45	20	3.64	11	3	5.2	6	10.3	16	27.6	17	29.3	16	27.6
K140	147	Construct rock gardens and other specialized areas.	58	3.63	3.8	25	3.42	19	3.67	12	1	1.7	6	10.3	17	29.3	23	39.7	11	19
B10	149	Plow, disk, rake, till, or otherwise prepare land.	61	3.62	3.8	26	3.3	20	3.75	12	1	1.6	5	8.2	21	34.4	23	37.7	11	18
B12	149	Fumigate plant beds.	60	3.62	3.2	26	3.74	19	3.92	12	1	1.6	8	13.3	19	31.6	17	28.3	15	25
G96	149	Remove dead or undesirable stock.	59	3.62	3.5	25	3.45	20	3.91	11	2	3.4	7	11.8	18	30.5	17	28.8	15	25.4
M169	149	Keep employee work records.	58	3.62	3.9	24	3.95	20	3	11	2	4.5	7	12.1	13	22.4	15	25.9	21	36.2
M176	149	Develop adequate record system for ordering and restocking plants and materials, pricing, determining quantities for production, and for profit analysis.	57	3.62	4.1	24	3.58	19	3.17	12	1	1.8	10	17.5	12	21.1	15	26.3	19	33.3
O200	149	Analyze current market trends and expansion possibilities.	60	3.62	3.9	25	3.7	20	3.25	12	2	3.3	10	16.6	9	15	20	33.3	19	31.6
F78	155	Force potted plants to bloom at seasonal times.	59	3.61	3.5	24	3.25	20	4.08	12	5	8.5	6	10.2	12	20.3	20	33.8	16	27.1
D49	156	Remove dead or unwanted trees or shrubs.	60	3.59	3.6	25	3.35	20	3.83	12	3	5	3	5	20	33.3	24	40	10	16.6
D50	156	Cultivate flower beds.	60	3.59	3.6	25	3.1	20	4.08	12	2	3.3	6	10	22	36.6	17	28.3	13	21.7
M181	156	Store received merchandise.	58	3.59	3.8	24	3.7	20	3.27	11	2	3.4	9	15.5	12	20.7	19	32.8	16	27.6
D48	159	Mow and trim lawns.	60	3.58	3.5	25	3.4	20	3.83	12	4	6.6	6	10	19	31.6	17	28.3	14	23.3
M179	159	Check received merchandise against invoice [illegible]ngs.	59	3.58	4	24	3.5	20	3.25	12	3	5.1	8	13.5	13	22	16	27.1	19	32.2

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Orig. No.	Rank	TASKS	Total No. Responses ( )	MEAN Group	Emplyr's	(N)	Emplye's	(N)	Educ's	(N)	FREQUENCY (N) & PCT. OF FREQUENCY (ADJ.) 1 (N)	1 Pct.	2 (N)	2 Pct.	3 (N)	3 Pct.	4 (N)	4 Pct.	5 (N)	5 Pct.
0209	159	Analyze business enterprises on cost and return basis.	60	3.58	4.2	25	3.3	20	3.25	12	2	3.3	8	13.3	15	25	17	28.3	18	30
D45	162	Repair worn spots in lawn with sod or reseeding.	59	3.57	3.6	25	3.2	20	3.91	11	2	3.3	4	6.7	22	37.2	20	33.8	11	18.6
I120	162	Develop light maintenance schedule for business vehicles, tractors, lifts, and other equipment (oil, lubrication, tire pressure, battery, brake fluid, radiator, etc.).	60	3.57	3.8	25	3.4	20	3.5	12	3	5	6	10	16	26.6	22	36.6	13	21.7
0199	162	Analyze new products and plants to determine if they need to be added to the sales line.	60	3.57	3.9	25	3.55	20	3.25	12	4	6.6	6	10	11	18.3	23	38.3	16	26.6
G87	165	Plow, disk, level, and lay off rows for planting.	58	3.56	3.7	24	3.15	20	3.82	11	1	1.7	7	12.1	19	32.7	20	34.5	11	18.9
L150	165	Display store merchandise for sale.	59	3.56	3.8	24	3.7	20	3.17	12	5	8.5	4	6.7	14	23.7	21	35.6	15	25.4
M168	167	Prepare and mail bills to collect accounts due.	58	3.55	3.8	24	3.75	20	3.09	12	3	4.5	8	13.8	13	22.4	17	29.3	18	31
M178	167	Keep current inventory of merchandise for sale.	56	3.55	3.7	24	3.68	19	3.27	11	2	3.6	7	12.5	14	25	18	32.1	15	26.8
0196	169	Establish employee wages, hours, and working conditions.	60	3.54	4	25	3.2	20	3.42	12	4	6.6	10	16.6	9	15	19	31.6	18	30
D30	170	Clean grounds of leaves and litter.	59	3.54	3.6	25	3.11	19	3.92	12	3	5.1	8	13.5	17	28.8	17	28.8	14	23.7
E58	171	Maintain and repair propagating structures and equipment.	58	3.53	3.6	26	3.16	19	3.82	11	4	6.8	6	10.3	15	25.8	23	39.7	30	51.7
0198	171	Knowledge of business laws, taxes, and laws pertaining to hiring, paying, and treating employees.	60	3.53	4.1	25	3.25	20	3.25	12	4	6.6	5	8.3	16	26.6	16	26.6	19	31.6
F64	173	Fill benches, pots, and flats.	59	3.52	3.1	24	3.3	20	4.17	12	3	5.1	7	11.8	20	33.8	18	30.5	11	18.6
I126	174	Recover greenhouses.	57	3.5	3.5	24	3.26	19	3.75	12	3	5.3	6	10.5	21	36.8	15	26.3	12	21.1
M175	174	File records and other materials.	59	3.5	3.8	24	3.45	20	3.25	12	4	6.7	6	10.2	15	25.4	19	32.2	15	25.4
0207	176	Prepare, negotiate, and implement sales contracts.	60	3.49	3.9	25	3.25	20	3.33	12	4	6.6	9	15	12	20	18	30	17	28.3
D39	177	Apply protective substance to tree wounds or cut surfaces.	59	3.48	3.3	24	3.4	20	3.75	12	0	0	10	16.9	20	33.8	20	33.8	9	15.3

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Orig. No.	Rank	TASKS	Total No. Responses ( )	MEAN							FREQUENCY (N) & PCT. OF FREQUENCY (ADJ.)									
				Group	Emplyr's	(N)	Emplye's	(N)	Educ's	(N)	1 (N)	1 Pct.	2 (N)	2 Pct.	3 (N)	3 Pct.	4 (N)	4 Pct.	5 (N)	5 Pct.
D43	177	Identify and remove poisonous plants.	60	3.48	3.6	25	3.35	20	3.5	12	2	3.3	4	6.6	24	40	19	31.6	11	18.3
I123	179	Maintain and repair small gas engines, dusters, sprayers, climbing equipment, etc.	59	3.47	3.5	24	3.5	20	3.42	12	3	5.1	8	13.5	16	27.1	21	35.6	11	18.6
N183	180	Arrange for transportation of materials purchased.	58	3.46	3.5	24	3.47	19	3.42	12	5	8.6	7	12.1	14	24.1	18	31	14	24.1
N184	180	Order repair parts for business vehicles and equipment.	56	3.46	3.6	24	3.32	19	3.46	11	3	5.4	8	14.3	16	28.6	18	32.1	11	19.6
O205	180	Determine business credit needs.	60	3.46	3.7	25	3.25	20	3.42	12	6	10	8	13.3	8	13.3	25	41.7	13	21.7
O208	180	Allocate monies in preparing budget.	60	3.46	3.8	25	3.25	20	3.33	12	5	8.3	9	15	10	16.6	20	33.3	16	26.6
D38	184	Scrape plant wounds.	60	3.45	3.3	25	3.4	20	3.67	12	0	0	11	18.3	20	33.3	20	33.3	9	15
J130	185	Make minor changes to agricultural and industrial equipment to adopt it to the nursery operation.	61	3.44	3.8	26	3.2	20	3.33	12	4	6.5	6	9.8	21	34.4	17	27.9	13	21.3
F60	186	Shred or screen different media materials.	59	3.42	3.2	24	3.05	20	4	12	4	6.7	7	11.9	20	33.9	19	32.2	9	15.3
O206	186	Locate sources of and secure credit.	60	3.42	3.6	25	3.4	20	3.25	12	6	10	9	15	13	21.7	15	25	17	28.3
M170	188	Prepare employee payroll.	59	3.39	3.6	24	3.4	20	3.17	12	4	6.7	12	20.3	12	20.3	12	20.3	19	32.2
L154	189	Follow up sales to determine customer satisfaction.	59	3.38	3.5	24	3.65	20	3	[illegible]	5	8.5	7	11.8	15	25.4	18	30.5	14	23.7
K132	190	Apply basic carpentry skills in building display beds, slathouses, storage sheds, greenhouses, and other construction projects.	59	3.37	3.4	25	3.37	19	3.33	12	0	0	10	16.9	24	40.7	19	32.2	6	10.2
I122	191	Repair display cases, storage shelves, slathouses, greenhouses, storage buildings, etc.	59	3.34	3.5	24	3.2	20	3.33	12	3	5.1	6	10.2	22	37.3	22	37.3	6	10.2
K139	192	Install proper edging for various landscape areas.	59	3.33	3.6	25	3.26	19	3.42	12	2	3.4	9	15.3	18	30.5	24	40.7	6	10.2
O197	192	Administer social security and other employee benefit programs.	60	3.33	3.5	25	3.25	20	3.25	12	9	15	7	11.7	14	23.3	11	18.3	19	31.6
F77	194	Force bulbs.	59	3.31	3.3	24	2.95	20	3.67	12	5	8.5	7	11.8	25	42.4	13	22	9	15.3
C22	195	Sprig a lawn.	60	3.3	3.3	26	3.1	20	3.55	11	3	5	7	11.7	27	45	16	26.6	7	11.7
K134	195	Install walls using railroad ties, block, [illegible]k, rock, or other materials.	60	3.3	3.5	25	3.15	20	3.25	12	1	1.6	8	13.3	27	45	18	30	6	10

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RICULUM CODE NO. & TITLE T-009 HORTICULTURE TECHNOLOGY

Orig. No.	Rank	TASKS	Total No. Responses ( )	MEAN Group	MEAN Emplyr's	(N)	MEAN Emplye's	(N)	MEAN Educ's	(N)	1 (N)	1 Pct.	2 (N)	2 Pct.	3 (N)	3 Pct.	4 (N)	4 Pct.	5 (N)	5 Pct.
B7	197	Clear brush and unwanted plants.	61	3.29	3.4	26	3.25	20	3.33	12	1	1.6	14	22.9	20	32.8	15	24.6	11	18
B14	198	Dig drainage ditches and install drain tile.	61	3.28	3.5	26	2.85	20	3.5	12	5	8.2	11	18	19	31.1	13	21.3	13	21.3
L171	199	Assist in records audit.	59	3.27	3.6	24	3.2	20	3	12	5	8.5	13	22	11	18.6	15	25.4	15	25.4
O201	200	Determine need for, select reputable insurer, and purchase comprehensive business insurance.	60	3.26	3.6	25	3.1	20	3.08	12	6	10	11	18.3	13	21.7	15	25	15	25
O211	200	Check credit references of customers.	58	3.26	3.7	25	2.9	19	3.18	11	5	8.6	11	19	14	24.1	15	25.9	13	22.4
B15	202	Install irrigation system if needed.	61	3.25	3.2	26	3.3	20	3.25	12	3	4.9	13	21.3	22	36.1	10	16.4	13	21.3
M173	203	Keep annual depreciation schedule.	59	3.24	3.5	24	3.3	20	2.92	12	6	10.2	11	18.6	12	20.3	16	27.1	14	23.7
M172	204	Prepare income tax and other necessary reports.	59	3.23	3.5	24	2.95	20	3.25	12	9	15.3	8	13.5	13	22	14	23.7	15	25.4
K137	205	Install walks and patios using brick, concrete, and other materials.	60	3.22	3.3	25	3.1	20	3.25	12	4	6.6	12	20	17	28.3	17	28.3	8	13.3
L152	205	Deliver or ship merchandise sold.	59	3.22	3.3	24	3.35	20	3	12	5	8.5	11	18.6	15	25.4	16	27.1	11	18.6
O210	207	Arrange trade-ins and credit terms.	58	3.2	3.6	25	2.9	19	3.09	11	7	13.1	11	19	11	19	16	27.6	13	22.4
K135	208	Construct planters.	60	3.19	3.3	25	3.2	20	3.08	12	1	1.6	12	20	27	45	14	23.3	6	10
L141	208	Advertise products effectively through newspapers, magazines, sales leaflets, radio, television, store displays, special displays, etc.	58	3.19	3.3	25	3.53	19	2.75	12	5	8.6	11	19	14	24.1	16	27.6	12	20.7
L142	208	Use supplier advertising materials effectively.	59	3.19	3.2	24	3.3	20	3.08	12	5	8.5	7	11.8	20	33.8	20	33.8	7	11.8
L158	211	Develop and verify customer directories.	59	3.18	3.3	24	3.4	20	2.83	12	3	5.1	13	22	15	25.4	22	37.3	6	10.2
M174	212	Develop customer credit records.	59	3.16	3.5	24	3.05	20	2.92	12	7	11.8	11	18.6	13	22	13	22	15	25.4
L151	213	Wrap and/or package merchandise sold.	59	3.11	3	24	3.15	20	3.17	12	5	8.5	14	23.7	19	32.2	13	22	8	13.5
D36	214	Clean drainage ditches, culverts, and gutters.	60	3.09	3.1	25	2.85	20	3.33	12	4	6.6	10	16.6	28	46.6	13	21.7	5	8.3
I121	215	Tune up business vehicles, tractors, lifts, and other equipment as needed.	60	3.06	3.4	25	3.1	20	2.67	12	7	11.7	14	23.3	14	23.3	14	23.3	11	18.3
K133	216	Install fences using different types of materials.	59	3.01	2.9	25	2.95	20	3.17	12	6	10.2	11	18.6	24	40.7	14	23.7	4	6.7

CURRICULUM CODE NO. & TITLE T-009 HORTICULTURE TECHNOLOGY

Orig. No.	Rank	TASKS	Total No. Responses ( )	MEAN Group	MEAN Emplyr's	(N)	MEAN Emplye's	(N)	MEAN Educ's	(N)	FREQUENCY (N) & PCT. OF FREQUENCY (ADJ.) 1 (N)	1 Pct.	2 (N)	2 Pct.	3 (N)	3 Pct.	4 (N)	4 Pct.	5 (N)	5 Pct.
L153	217	Rent equipment to customers.	59	2.99	2.8	24	3.1	20	3.08	12	9	15.3	13	22	15	25.4	16	27.1	7	11.8
B8	218	Fell and remove trees.	60	2.95	2.9	26	2.85	20	3.09	11	7	11.7	13	21.7	22	36.6	14	23.3	4	6.6
D53	219	Repair walkways, driveways, and patios.	59	2.92	3.2	26	2.84	19	2.73	11	2	3.4	16	27.1	22	37.2	17	28.8	2	3.4
I124	220	Glaze windows.	59	2.91	2.8	24	2.75	20	3.17	12	6	10.2	13	22	25	42.4	11	18.6	4	6.7
I125	221	Paint buildings, shelves, bins, etc.	59	2.84	2.8	24	2.8	20	2.92	12	6	10.2	16	27.1	24	40.7	8	13.5	5	8.5
K136	222	Construct garden bench seats.	60	2.82	3	25	2.7	20	2.75	12	5	8.3	17	28.3	23	38.3	12	20	3	5
K138	223	Erect suitable lighting for recreation and garden areas.	60	2.68	3	25	2.7	20	2.33	12	6	10	21	35	18	30	11	18.3	4	6.6
J133	224	Make minor equipment repairs.	58	2.39	2.6	25	2.42	19	2.17	12	19	32.8	14	24.1	14	24.1	4	6.9	7	12.1

APPENDIX D

SUBJECT AREA TASKS

Tasks required for the Horticulture Technology curriculum are listed by subject areas below:

Technical/Vocational (Major)

FACILITY AND EQUIPMENT MAINTENANCE AND REPAIR

The student will be able to:

Keep work, storage, delivery area, display area, nursery, greenhouse, salesroom, and other facilities neat and clean.

Clean and sharpen hand tools.

Develop light maintenance schedule for business vehicles, tractors, lifts, and other equipment (oil, lubrication, tire pressure, battery, brake fluid, radiator, etc.).

Tune up business vehicles, tractors, lifts, and other equipment as needed.

Repair display cases, storage shelves, slathouses, greenhouses, storage buildings, etc.

Maintain and repair small gas engines, dusters, sprayers, climbing equipment, etc.

Glaze windows.

Paint buildings, shelves, bins, etc.

Recover greenhouses.

Make minor changes to agricultural and industrial equipment to adopt it to the nursery operation.

Maintain and repair propagating structures and equipment.

Make minor equipment repairs.

GARDEN CENTER OPERATION

The student will be able to:

Advertise products effectively through newspapers, magazines, sales leaflets, radio, television, store displays, special displays, etc.

Use supplier advertising materials effectively.

Identify customer needs and wants.

Describe to customers the purposes and qualities of merchandise for sale.

Take orders for sales or service by telephone.

Quote cost of plants.

Make cost estimates on customer orders.

Use effective interpersonal relationships in dealing with customers.

Label and price mark merchandise.

Display store merchandise for sale.

Wrap and/or package merchandise sold.

Deliver or ship merchandise sold.

Rent equipment to customers.

Follow up sales to determine customer satisfaction.

Prepare and keep current price lists and sales catalogs.

Suggest to customer plant materials to be used under their situations.

Develop and verify customer directories.

Use cash register, adding machine, calculator, and other recording devices.

Advise customers on fertilization, disease, and insect control using current information.

Answer customer complaints.

Write up customer orders.

Water and properly care for plants on display and/or storage.

Repair or reball balled and burlapped plants.

GREENHOUSE PRODUCTION

The student will be able to:

Identify media materials.

Shred or screen different media materials.

Determine soil mix for specific plant requirements.

Sterilize mixed soils.

Apply correct amendments to soil mix.

Fill benches, pots, and flats.

Make propagation and seed sowing schedules.

Sow seed in appropriate containers.

Make plant cuttings and put in appropriate containers and media.

Transplant seedlings to pots, flats, etc.

Label planted specimens.

Properly water greenhouse stock.

Prune and thin plants.

Fertilize plants.

Pinch potted plants.

Control temperature with fans and heaters.

Control humidity with ventilating fans and humidifiers.

Control the type and amount of light.

Force bulbs.

Force potted plants to bloom at seasonal times.

Identify weeds and control them by chemicals, plastic, and mechanical means.

Fumigate greenhouse.

Identify, remove, and destroy diseased plants.

Control plant insects and diseases with chemicals.

Remove plants from bed to sell.

Select proper pot sizes for replanting plants.

Identify labor needs.

Determine types and amount of equipment to buy and stock.

Identify and select producers and suppliers of plants, equipment, supplies, etc.

Select and purchase equipment, supplies, etc.

Enforce safety regulations.

Recruit and select employees.

Train employees.

Designate employee work assignments.

Supervise employees.

Evaluate employee performance.

Perform personnel actions such as promoting, firing, disciplinary action, etc.

Establish employee wages, hours, and working conditions.

Analyze new products and plants to determine if they need to be added to the sales line.

Analyze current market trends and expansion possibilities.

Determine business credit needs.

Locate sources of and secure credit.

Prepare, negotiate, and implement sales contracts.

LANDSCAPE CONSTRUCTION

The student will be able to:

Apply basic carpentry skills in building display beds, slathouses, storage sheds, greenhouses, and other construction projects.

Install fences using different types of materials.

Install walls using railroad ties, block, brick, rock, or other materials.

Construct planters.

Construct garden bench seats.

Install walks and patios using brick, concrete, and other materials.

Erect suitable lighting for recreation and garden areas.

Install proper edging for various landscape areas.

Construct rock gardens and other specialized areas.

LANDSCAPE DESIGN

The student will be able to:

Identify and use drafting equipment.

Develop knowledge of landscape symbols.

Key and letter a drawing.

Consult with client to determine his needs and wishes.

Survey the landscape area.

Locate existing water and sewer lines in landscape areas.

Develop landscape design by using principles and techniques that fit the job.

Select appropriate plant materials for the design.

Estimate labor in terms of numbers of men and hours.

Prepare cost estimate of plan.

Estimate costs of projects and make proper bids.

Read and interpret landscape plans drawn by designers and architects.

LANDSCAPE MAINTENANCE

The student will be able to:

Clean grounds of leaves and litter.

Identify weeds, pests, and diseases.

Determine methods of control needed to eradicate weeds, pests, and diseases.

Apply appropriate control measures and calibrate proper equipment.

Follow all safety precautions when administering control measures.

Discuss factors affecting control measures (wind, rain, temperature, etc.).

Clean drainage ditches, culverts, and gutters.

Prune and remove dead or unwanted plant branches.

Scrape plant wounds.

Apply protective substance to tree wounds or cut surfaces.

Prune and trim trees and shrubs at the correct time using proper equipment and methods.

Prepare lawn for reseeding.

Reseed, sod, or sprig a lawn.

Identify and remove poisonous plants.

Treat plant wounds and disease infestations.

Repair worn spots in lawn with sod or reseeding.

Apply lime and fertilizer according to soil test.

Water flower beds, lawns, trees, and shrubbery.

Mow and trim lawns.

Remove dead or unwanted trees or shrubs.

Cultivate flower beds.

Transplant trees and/or shrubs.

Select and use mulches.

Repair driveways, walkways, and patios.

LANDSCAPE PREPARATION AND PLANTING

The student will be able to:

Determine time of year to plant various species.

Select proper planting site for different types of plants.

Lay out space requirements.

Clear brush and unwanted plants.

Fell and remove trees.

Take soil sample and interpret results.

Plow, disk, rake, till, or otherwise prepare land.

Prepare flower and shrub beds for planting.

Fumigate plant beds.

Apply proper amounts of lime and fertilizer based on soil test results.

Dig drainage ditches and install drain tile.

Install irrigation system if needed.

Dig holes for plant setting.

Apply pre-emergency chemicals for weed control.

Mix the soil and soil conditioners.

Relocate plants if needed.

Seed a lawn.

Place sod.

Sprig a lawn.

Place plants in beds, trenches, and holes.

Backfill the hole with soil mix.

Properly water the lawn, flowers, shrubs, and trees.

Mulch plantings with proper materials.

Untie and groom plants.

Support plants by guying, staking, or cabling.

Clean up and make final inspection of landscape job.

Carry out or implement landscape design plans.

Determine appropriate plant replacements if specified plants are not available in landscape plan.

NURSERY PRODUCTION

The student will be able to:

Take soil sample and interpret data.

Calibrate spreader and apply fertilizer and lime according to soil test data.

Plow, disk, level, and lay off rows for planting.

Lay off and install drainage system if needed.

Install and operate irrigation system.

Properly plant various species of plants.

Cultivate plants.

Develop fertilization program for maintaining plants.

Properly fertilize plants.

Prune plants at proper time using appropriate methods.

Identify weeds, pests, and diseases.

Remove dead or undesirable stock.

Determine methods of control needed to eradicate weeds, pests, and diseases.

Apply appropriate control measures.

Discuss factors affecting control measures (wind, rain, temperature, etc.).

Follow all safety factors when administering control measures.

Dig plants properly (machine or by hand).

Select proper media and prepare media according to soil tests.

Select properly sized containers.

Sterilize media.

Pot and repot plants properly.

Prepare the beds including drainage system.

Space containers properly in beds.

Set up and maintain irrigation system.

Operate irrigation system.

Mulch plants properly for winter protection.

Prune plants at proper time using appropriate methods.

Operate efficiently all equipment used in the nursery (tractors, tractor implements, planting augers, plant diggers, trenchers, front-end loaders, trucks, soil mixers, potting machines, etc.).

Follow safety precautions for all equipment.

Determine appropriate equipment to use for various jobs.

Identify labor needs.

Determine kinds and amount of equipment to buy and stock.

Identify and select producers and suppliers of plants, equipment, supplies, etc.

Select and purchase equipment, supplies, etc.

Enforce safety regulations.

Recruit and select employees.

Train employees.

Designate employee work assignments.

Supervise employees.

Evaluate employee performance.

Perform personnel actions such as promoting, firing, disciplinary action, etc.

Establish employee wages, hours, and working conditions.

Analyze new products and plants to determine if they need to be added to the sales line.

Analyze current market trends and expansion possibilities.

Determine business credit needs.

Locate sources of and secure credit.

Prepare, negotiate, and implement sales contracts.

PLANT IDENTIFICATION AND CULTURAL REQUIREMENTS

The student will be able to:

Identify plants by common and scientific name (annuals, biennials, perennials, etc.).

Use resource material to identify unknown plants which cannot be identified by visual inspection.

Determine cultural requirements of plants (light, soil, moisture, temperature, etc.).

PROPAGATION TECHNIQUES

The student will be able to:

Select proper propagating stock.

Propagate different types of plants at the correct time using proper techniques and procedures.

Identify and utilize properly propagating structures and equipment.

Develop propagating systems to meet specific objectives.

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Related

AGRICULTURAL CHEMICALS

The student will be able to:

Describe the importance of agricultural chemicals.

List the various types of control of pests.

Discuss the history of agricultural chemical use.

Explain how tolerances are determined.

Explain how pesticides are rated according to toxicity and persistence.

Discuss pesticide registration.

List the beneficial and detrimental effects of pesticides in regards to agricultural production and our environments.

Discuss the laws affecting applicator usage of pesticides.

Define various terms associated with chemical terminology.

List major safety factors in handling and using chemicals.

Interpret pesticide labels correctly.

Identify facts contained on a pesticide label.

Identify the various weeds affecting horticultural crops.

List various herbicides that control different types of weeds.

State the difference between preplanting, preemergence, and postemergence.

Explain why timing of a pesticide application is important.

List types of chemicals used to alter or change normal crop growth processes.

List climatic factors affecting pesticide application.

List factors an applicator must consider when choosing the appropriate pesticide.

Distinguish between general use and restricted use pesticides.

List the types of pesticide formulations.

Discuss advantages, disadvantages, and principle uses of various types of formulations.

List the types of equipment used for applying pesticides.

Calibrate the various types of application equipment.

Demonstrate the proper use of equipment.

Describe the importance of drift control.

List safety precautions to observe when cleaning and storing equipment after use.

Calculate problems involving pesticide equipment calibration.

Name methods for disposal of pesticides and pesticide containers.

List the major factors affecting pesticide application.

Calculate problems determining amounts of wettable powder and other formulations to use.

List reasons for keeping records of pesticide use.

List items of information needed for recordkeeping.

Name common claims brought against applicators and/or owners.

Discuss insurance for pesticide mishaps.

BUSINESS MANAGEMENT

The student will be able to:

Take periodic inventory.

Keep records of receipts and expenses.

Prepare and mail bills to collect accounts due.

Keep employee work records.

Prepare employee payroll.

Assist in records audit.

Prepare income tax and other necessary reports.

Keep annual depreciation schedule.

Develop customer credit records.

File records and other materials.

Develop adequate record system for ordering and restocking plants and materials, pricing, determining quantities for production, and for profit analysis.

Keep maintenance and repair records on equipment.

Keep current inventory of merchandise for sale.

Check received merchandise against invoice listings.

Check invoices for errors.

Store received merchandise.

Order replacement and/or new merchandise.

Arrange for transportation of materials purchased.

Order repair parts for business vehicles and equipment.

Administer social security and other employee benefit programs.

Identify and utilize business laws, tax laws, and laws pertaining to hiring, paying, and treating employees.

Determine need for, select reputable insurer, and purchase comprehensive business insurance.

Allocate monies in preparing budget.

Analyze business enterprises on cost and return basis.

Arrange trade-ins and credit terms.

Check credit references of customers.

BUSINESS MATHEMATICS

The student will be able to:

Round decimal numbers.

Add whole numbers and decimals.

Subtract whole numbers and decimals.

Multiply whole numbers and decimals.

Divide whole numbers and decimals.

Add, subtract, multiply, and divide fractions.

Reduce fractions to the lowest terms.

Add, subtract, multiply, and divide mixed numbers and improper fractions.

Convert fractions, decimals, and percents.

Determine percentages.

Determine the rate of increase or decrease.

Compute the total list price of a purchase.

Compute trade discounts.

Compute cash discounts.

Set a selling price by using the markup formula.

Compute gross profits by using the formula for gross profit.

Compute freight charges and sales tax on sales.

Compute depreciation using the straight-line method.

Compute depreciation using the units-of-production method.

Compute depreciation using the machine-hours method.

Calculate depreciation using the declining-balancing method.

Calculate depreciation using the sum-of-the-year's digit method.

Calculate additional first-year depreciation.

Calculate gains and/or losses on the sale of tangible assets.

Compute gross wages, federal withholding tax, FICA tax, and the net wages for an employee.

Compute the employer's expense for employees.

List the types of insurance needed in business and industry and for personal property.

Compute simple interest for a year or more.

Compute simple interest for less than a year.

Compute simple interest using the 60-day, 6% method.

Compute simple interest using the simple interest tables for a 360-day year and a 365-day year.

Find the due date of a promissory note.

Determine the maturity date on a bank discount and compute terms of discount.

Compute the proceeds of a discounted customer's note.

Compute compound interest.

Compute compound interest on savings accounts.

Find the amount of annuity on a sum of money by using an annuity table.

Calculate the present value on a sum of money with and without a present value table.

Compute the total cost for an installment purchase.

Compute the finance charges on an installment purchase.

Compute the monthly (periodic) payment on an installment purchase.

Compute the finance charge on an actuarial loan.

Prepare a debt reduction schedule.

Compute the true annual interest rate on an installment purchase.

Compute the true annual interest rate on a financial loan.

Compute the true annual interest rate using the constant ratio formula.

Reconcile a bank statement.

Figure the value of inventories using one of the four inventory methods and compute the turnover.

Translate decimal numbers to the equivalent binary numbers and translate binary numbers to the equivalent decimal numbers.

Convert decimal and binary numbers and translate hexadecimal numbers to decimal and binary numbers.

Discuss the mathematics of business ownership.

Discuss the mathematics of investment.

Discuss the mathematics of summary analysis.

CHEMISTRY

The student will be able to:

Discuss the history and development of chemistry.

State the conditions required for the "scientific approach."

Analyze and interpret data using the "scientific approach."

List the common temperature scales.

Convert a temperature measurement from one scale to another.

Calculate the density of a substance from given data.

Convert a measurement made in English units to metric units and vice versa.

Give the names of the common elements when given the symbols or the symbols when given the names.

Determine the molar mass or the number of grams per mole of an element using the periodic table or a list of atomic weights.

Describe Dalton's atomic theory of matter.

Describe the meaning and give a molar interpretation of the formula of a compound.

Calculate the percentage by mass composition of a compound.

Determine the empirical formula of a compound.

Balance a simple chemical equation given the formulas of the reactants and products.

List, with the aid of the periodic table, the elements that are gases, the elements that are liquids, and the elements that occur in the form of diatomic molecules.

Describe the concept of oxidation and reduction.

Define electrons, protons, and neutrons.

Describe the ionic bond and the covalent bond.

Describe how the ionization energy of the elements varies within the periodic table.

State the common oxidation numbers for hydrogen and oxygen.

Define acids, bases, and salts.

List the properties of acids, bases, and salts.

Describe a gas using the kinetic molecular theory or state the postulates of the theory.

State Boyle's and Charles' law.

Give the molar interpretation of an equation.

Describe the liquid state.

Describe the evaporation of liquids.

Describe the solidification or freezing of a liquid.

Define molarity and molality.

List the properties of electrolytes and non-electrolytes.

Discuss the concepts of neutralization and solubility.

Define organic chemistry.

PLANT SCIENCE

The student will be able to:

Describe the historical background of plant science.

Name the fields of plant science.

Define the terms annuals, biennials, and perennials.

Draw the different parts of a seed.

List the requirements for seed germination.

Identify the various methods of fruit and seed dispersal.

Name the various structures of flowering plants.

Identify and describe the functions of the parts of a cell.

Describe the difference between inhibition and osmosis.

Demonstrate the process of osmosis in a laboratory experiment.

Describe the formation of new cells through the process of mitosis.

Name and describe the functions of various types of roots found in a root system.

Identify the three regions of roots (cell division, cell elongation, and cell maturation).

Describe the process of absorption of materials by roots.

Name and describe the function of specialized roots.

List the chief functions of stems.

Provide examples of woody and herbaceous stem types.

Name and describe the functions of the different types of buds.

Define and give examples of specialized stems.

List the external differences between stems and roots.

Draw the internal structure of woody stems.

Define the functions of the internal parts of woody stems.

Describe the differences between Monocotyledons and Dicotyledons.

List and define the chemical properties of wood.

List examples of softwoods and hardwoods.

Determine the specific gravity of different types of wood.

Provide examples of the three types of arrangement of leaves.

List and describe the function of the external parts of leaves.

Draw the internal structure of leaves.

List four examples of specialized leaves.

Describe the process of leaf fall of plants.

Illustrate the processes of photosynthesis and transpiration.

List the factors that affect the rate of transpiration in plants.

List the sixteen essential soil elements.

Define micronutrients and macronutrients.

List the physiological functions of soil elements.

Define carbohydrates, fats, and proteins.

Describe the functions of digestion and respiration in plants.

Illustrate the nature of plant growth.

List the internal factors of plant growth and describe each factor.

Illustrate the effect of light, temperature, moisture, and soil nutrients on plant growth.

Set up probability charts for several crosses of plants to determine color, size, etc.

SOIL SCIENCE AND FERTILIZERS

The student will be able to:

Define soil.

Discuss the early concepts of soil science and plant growth.

List and provide the sixteen essential plant food elements according to major, secondary, and trace element designations.

Discuss the factors affecting soil formation.

Draw and label the various parts of a soil profile.

List and discuss the physical, biological, and chemical properties of soils.

Determine the texture and structure of different soils.

Determine the particle density, bulk density and pore space of different soils.

Take soil samples, submit samples to soil testing laboratory and interpret results.

Discuss the use of soil survey maps.

List the factors basic to land use classification.

Discuss the characteristics and uses of the eight land capability classes.

Determine the land capability classes of various tracts of land.

Define the three classifications of soil water.

Determine the amount of water in various samples of soils.

Discuss how water is lost from the soil.

Illustrate the pH scale.

Discuss the affects of soil acidity on plant production.

Determine the pH of various soil samples.

List the causes of soil acidity.

Describe how lime reduces soil acidity.

List the types of liming materials.

Apply lime and fertilizer correctly on various types of plants and crops based on soil test reports.

Define fertilizer ratio, grade, and complete fertilizer.

Select proper analysis fertilizers for different plants and crops.

List the various types of materials used to supply nitrogen, phosphorus and potash.

Develop a fertilization program for maintaining plants.

Illustrate the effects of fertilizer injury.

Describe the uses of special fertilizers.

List and discuss the methods for maintaining soil fertility.

General Education

GRAMMAR

The student will be able to:

Identify and use correctly the principal parts of speech.

Identify, name, and use common nouns correctly.

Identify the forms and uses of verbs

Identify and use the correct forms of pronouns.

Identify adjectives and adverbs.

Identify prepositions and conjunctions as connectors.

Select the proper words to be used in writing.

Divide words in writing.

Identify a complete sentence.

Identify types of sentences.

Identify and write the four sentence classes.

Write sentences with variety.

Discuss types of sentences and the correct end punctuation.

Identify comma uses:

1. To introduce
2. To separate.
3. To enclose.
4. To indicate omission.

Identify and use the internal marks of punctuation.

Construct a paragraph using a topic sentence.

Identify and construct a topic sentence and expand the topic sentence by various methods.

Place sentence in effective order.

Write paragraphs with unity and coherence.

Recognize mistakes in written materials and make the necessary corrections.

COMPOSITION

The student will be able to:

Write clearly and effectively.

Write a paragraph.

Develop a composition.

Develop a direct prose style.

Construct a prose style and avoid mechanical errors.

Discuss types of writing.

List various writing techniques needed in preparing technical reports, business communications, and other written communications.

Write short essays in a limited time period.

Select topics for papers.

Compose writings that exhibit the techniques of exposition, persuasion, description, narration, and dialogue.

Identify grammatically correct/incorrect sentences.

Use the library and resource materials in writing.

Read written communication.

Analyze written communication.

Revise written communication.

ORAL COMMUNICATION

The student will be able to:

Discuss the basic concepts of oral communication.

List the elements of communication.

Discuss circular response in communicating.

List criteria for effective speech.

List steps to achieve more effective speech.

Use the body to communicate.

Use the voice to communicate.

Discuss the mechanics of speaking.

Prepare speeches.

Analyze the audience.

Analyze the occasion for the speech.

Determine the purpose of the speech.

List and discuss the general purposes for speeches:

1. To entertain.
2. To inform (educate).
3. To persuade.
4. To discuss (exchange ideas).

Select the subject for the speech.

Gather material for a speech.

Organize the material for a speech.

Practice the speech aloud.

Listen effectively.

REPORT WRITING

The student will be able to:

Write coherent and comprehensive sentence definitions and develop expanded definitions.

Describe a mechanism and explain a process.

Identify the types of reports and explain proficiency in reporting.

Recognize the qualities to strive for in good reports.

Compile reports by filling in blank forms.

Compile letter reports.

Compile a progress report.

Interpret and complete miscellaneous reports.

Identify a covering memorandum.

Prepare the necessary information for a title page.

Organize and prepare information for a table of contents.

Compile summaries and abstracts proficiently.

Prepare adequate information for an effective introduction.

Write conclusions and make logical recommendations.

Compile a bibliography from varied sources.

Select an appropriate topic and narrow it for effective development.

Develop an outline in logical order.

Implement the use of tables and figures in reports.

Write the first draft from note cards of materials gathered.

Make revisions of the first draft.

Identify the use of the inter- and intra-firm proposal.

Make effective use of a proposal.

Write the segments of a proposal.

Write a letter of application adhering to acceptable standards of business correspondence.

Identify and write each part of the letter effectively.

Compile a resume to accompany the application letter.

Write an acceptable letter following the interview.

APPENDIX E

COMPETENCIES - HORTICULTURE TECHNOLOGY CURRICULUM

Task	Competency	Criterion Measure
A. Plant Identification and Cultural Requirements		
A1. Identify plants by common and scientific name (annuals, biennials, perennials, etc.).	. Correctly identify plants by their common and scientific names and correctly spell the common and scientific names of identified plants.	. Selected plants are correctly identified by common and scientific names. . Common and scientific names of selected plants are spelled correctly.
A2. Use resource material to identify unknown plants which cannot be identified by visual inspection.	. Correctly identify selected plants by their common and scientific names by using resource materials.	. Selected plants are correctly identified by their common and scientific names using resource materials.
A3. Determine cultural requirements of plants (light, soil, moisture, temperature, etc.).	. Identify the cultural requirements of selected plants.	. Cultural requirements of selected plants are correctly identified.
B. Preparing a Landscape		
B4. Determine the time of year to plant various species.	. Select the optimum planting dates for various plant species.	. Optimum planting dates are correctly given for selected plants.
B5. Select proper planting site for different types of plants.	. Select the proper planting sites for various plant species.	. Planting sites for selected plants are chosen correctly according to topography, soil conditions, climatic conditions, water requirements, plant use, artifacts, and existing vegetation.

COMPETENCIES - HORTICULTURE TECHNOLOGY CURRICULUM

Task	Competency	Criterion Measure
B6. Lay out space requirements.	. Lay out space requirements for selected plants.	. Space requirements are laid out correctly for selected plants according to plant uses, plant characteristics, artifacts, and existing vegetation.
B7. Clear brush and unwanted plants.	. Clear brush away from area without damaging vegetation. . Identify and remove unwanted plants.	. Brush is removed from the area by hand or with motorized equipment without damaging existing vegetation. . Unwanted plants are identified according to the factors of land use, plant use, plant conditions, and plant characteristics. . Unwanted plants are removed by hand or with motorized equipment without damaging other vegetation. . All equipment is operated safely and correctly.
B8. Fell and remove trees.	. Fell and remove trees safely without damaging other vegetation.	. Trees are marked and then cut using hand and power tools safely and efficiently. . Direction of tree fall is controlled in order to damage other trees and vegetation as little as possible. . Trees are removed using hand and power tools and equipment safely and efficiently and without damaging other vegetation.

COMPETENCIES - HORTICULTURE TECHNOLOGY CURRICULUM

Task	Competency	Criterion Measure
B9. Take soil sample and interpret results.	. Take soil samples according to established procedures, fill out information sheet, submit samples to a soil testing laboratory, and interpret the returned results.	. Soil samples are taken according to established and approved procedures. . Information sheets are completed giving information on land use and fertilization and liming records. . Soil samples and information sheets are mailed to state or private soil testing laboratories. . Soil test results are interpreted and fertilization and liming amounts are determined.
B10. Plow, disk, rake, till or otherwise prepare land.	. Prepare a good seedbed by plowing, disking, tilling, raking, etc.	. Appropriate tools and equipment are selected. . The prepared seedbed is even and finely textured to a depth of 3-4 inches. . The equipment used in seedbed preparation is set up and adjusted correctly to provide maximum efficiency. . Tractor operation is efficient and handling procedures listed in the operator's manual are followed. . All safety precautions are observed.

COMPETENCIES - HORTICULTURE TECHNOLOGY CURRICULUM

Task	Competency	Criterion Measure
B11. Prepare flower and shrub beds for planting.	. Prepare flower and shrub beds using tillers, rakes, hoes, etc.	. Flower and shrub beds are even, finely textured to a depth of 3-4" and raked to remove rocks and other debris. . Tile is installed for proper drainage if needed.
B12. Fumigate plant beds.	. Fumigate plant beds safely using correct chemicals, materials, and procedures.	. A recommended fumigant is chosen. . An effective fumigation method is selected and recommended procedures followed. . Equipment is correctly calibrated. . Plant beds are safely and properly fumigated. . All safety precautions are observed.
B13. Apply proper amounts of lime and fertilizer based on soil test results.	. Apply recommended amounts of lime and fertilizer per acre based on soil test results using calibrated equipment.	. Lime and fertilizer amounts per acre are determined according to soil test results. . Equipment is properly calibrated for application of determined rates. . Equipment is operated according to instructions found in the operator's manual. . All safety precautions are observed.

COMPETENCIES - HORTICULTURE TECHNOLOGY CURRICULUM

Task	Competency	Criterion Measure
B14. Dig drainage ditches and install drain tile.	. Dig drainage ditches and install drain tile using prepared blueprints.	. Drainage ditches are dug to the proper depth, width, and slope. . Hand and motorized equipment is used efficiently and operated according to recommendations found in owner's manual. . Tile is selected that will do the best job for the situation. . Drain tile is installed using recommended procedures. . The tile line has the proper slope or grade. . All safety precautions are observed.
B15. Install irrigation system if needed.	. Install an irrigation system to fit the requirements of the nursery. . Read and interpret blueprints.	. An irrigation method is chosen that fits the needs of the nursery or the situation. . An adequate water source is used. . For a sprinkler system, proper size is selected to adequately feed water to all designated areas. . For a sprinkler system, pipes are properly installed, and risers are located to allow for small overlaps of water. . An adequate size pump or pumps are selected. . Pumps are installed according to manufacturer's recommendations. . The system or method chosen is operated according to recommendations.

COMPETENCIES - HORTICULTURE TECHNOLOGY CURRICULUM

Task	Competency	Criterion Measure
B16. Dig holes for plant setting.	. Dig holes mechanically or by hand for various plant species.	. Holes are dug with the correct depth and diameter for selected plants. . The equipment used to dig holes mechanically is operated according to manufacturer's recommendations. . Post hole diggers, picks, shovels, and mattocks are used efficiently.
B17. Apply pre-emergence chemicals for weed control.	. Apply pre-emergence chemicals for weed control on various plant species using calibrated equipment.	. Recommended pre-emergence chemicals are chosen for weed control for various weeds on selected plants. . Correct method of application is chosen depending on the situation. . Equipment is properly calibrated. . Herbicides are applied at the correct time and at the recommended rate, without damaging other vegetation. . Equipment is operated according to manufacturer's recommendations. . All safety precautions are observed.

COMPETENCIES - HORTICULTURE TECHNOLOGY CURRICULUM

Task	Competency	Criterion Measure
B18. Mix the soil and soil conditioners.	. Mix the soil and soil conditioners by hand or mechanically.	. Soil and soil conditioners are uniformly mixed. . Mechanical equipment is operated according to manufacturer's recommendations. . Shovels, rakes, and hoes are used efficiently. . Soil mixture is free of lumps, individual ingredients, or foreign material.
B19. Relocate plants, if needed.	. Dig established plants by hand or mechanically and replant them in a designated area.	. Established plants are dug without damaging the roots, bark, stems, branches, or foliage. . Recommended procedures are followed when digging plants. . Equipment used in digging plants is operated according to manufacturer's recommendations, and all recommended procedures are followed. . Shovels, mattocks, and other hand equipment is properly used. . Plantbeds and holes are prepared according to recommended practices. . Plants are placed in holes and beds according to recommended practices.

COMPETENCIES - HORTICULTURE TECHNOLOGY CURRICULUM

Task	Competency	Criterion Measure
C. Planting a Landscape		
C20. Seed a lawn.	. Select seed and seed a prepared area by hand and by using mechanical seeders.	. Appropriate type of grass seed is selected for a designated location. . Seeds are sown evenly and at recommended rates. . Mechanical seeders are operated according to manufacturer's recommendations. . Seeders are calibrated accurately. . An appropriate mulch is used and spread evenly over the area. . The soil is watered adequately.
C21. Place sod.	. Select type of grass for sodding and lay sod in a designated area that has been prepared.	. Appropriate type of grass is selected for sodding a designated location. . Sod is laid evenly and level, with sides and ends fitting close together. . Sod is cut where necessary to fit closely to walks, borders, and other objects. . Sod is pounded down to adhere to ground. . Sod is watered thoroughly.

COMPETENCIES - HORTICULTURE TECHNOLOGY CURRICULUM

Task	Competency	Criterion Measure
C22. Sprig a lawn.	. Select type of grass for sprigging and sprig a prepared area using recommended procedures.	. Appropriate type of grass is selected for sprigging a designated location. . Sprigs are planted at the proper depth and spacing. . Soil is packed around the sprigs and sprigs are watered thoroughly.
C23. Place plants in beds, trenches, and holes.	. Place and plant plants in prepared beds, trenches, and holes.	. Plants are placed straight and at the correct depth. . Plants are planted in best area for type of plant--beds, trenches, or holes. . Plants are spaced so as not to crowd each other and are attractive. . Holes are backfilled carefully so as not to damage roots, stems, bark, or foliage.
C24. Backfill the hole with soil mix.	. Backfill the hole with soil mix.	. Soil mix is packed firmly under and around the plant. . The mix is placed carefully around the plant to prevent injury. . A mound is constructed around the plant for adequate watering.

COMPETENCIES - HORTICULTURE TECHNOLOGY CURRICULUM

Task	Competency	Criterion Measure
C25. Properly water the lawn, flowers, shrubs, and trees.	. Water the lawn, flowers, shrubs, and trees for adequate soil moisture.	. Lawn and plants are watered only when they need to be watered. . No damage or injury is done to the lawn or plants. . The correct type of equipment is selected depending on what is to be watered. . No more water is applied at any one time than is needed to do an adequate job. . Water is evenly distributed to the area.
C26. Mulch plantings with proper materials.	. Mulch plantings with proper materials.	. Appropriate mulches are selected for designated plantings. . Designated areas are mulched at the appropriate time and to the proper depth. . Mulches are applied carefully in order not to damage plants.
C27. Untie and groom plants.	. Untie and groom plants.	. Plants are untied carefully in order not to damage or injure them. . The best method of grooming plants is selected. . Grooming is done properly and without injuring the plants.

COMPETENCIES - HORTICULTURE TECHNOLOGY CURRICULUM

Task	Competency	Criterion Measure
C28. Support plants by guying, staking, or cabling.	. Support plants by guying or staking.	. Correct type, number, and amount of materials are selected depending upon size and type of plants. . Stakes are placed around the plant and driven into the ground with approximately 1/3 of the stakes showing above ground. . Wire is placed around the plant with hose used for protection. . Torn buckles are installed and an even amount of tension is applied to each wire.
C29. Clean up and make final inspection of landscape job.	. Clean up and make final inspection of landscape job.	. All debris is removed from the job and properly disposed. . The area is raked or otherwise groomed and left neat and attractive. . All damaged plants, walkways, etc. are repaired or replaced. . The area is inspected one last time to see that all special requests and other details of the landscape plan have been met and that the area is free of debris and is attractive.

COMPETENCIES - HORTICULTURE TECHNOLOGY CURRICULUM

Task	Competency	Criterion Measure
D. Landscape Maintenance		
D30. Clean grounds of leaves and litter.	. Remove leaves and litter from lawns and shrubbery by hand and by using equipment.	. Lawns and shrubbery are free of leaves and litter. . Leaves and litter are removed without damaging grass or shrubbery. . Equipment is operated efficiently and safely according to operator's manual.
D31. Identify weeds, pests, and diseases.	. Correctly identify weeds, diseases, insects, and damage by other pests visually and by using resource materials . Spell the common names of weeds, diseases, and insects.	. Selected weeds are identified by common names visually and by using resource materials. . Selected diseases are identified by common names visually and by using resource materials. . Selected insects are identified by common names visually and by using resource materials. . Damage caused by other pests (i.e. rabbits) are identified. . Common names of weeds, diseases, and insects are spelled correctly.
D32. Determine methods of control needed to eradicate weeds, pests, and diseases.	. List control methods for weeds, pests, and diseases from memory or by using reference material.	. Control methods for weeds, pests, and diseases are correctly provided by recall or by using reference material.

COMPETENCIES - HORTICULTURE TECHNOLOGY CURRICULUM

Task	Competency	Criterion Measure
D33. Apply appropriate control measures and calibrate proper equipment.	. Apply control measures on weeds, pests, and diseases using chemicals, and other measures where appropriate. Calibrate equipment.	. Chemical control measures are applied correctly following label instructions. . Sprayers, dusters, and foggers are operated according to manufacturer's recommendations and calibrated correctly. . Biological, cultural, sanitation, and chemical control measures are used where appropriate and recommended procedures followed. . All safety precautions are observed. . Equipment is thoroughly cleaned after each use, removing all residues.
D34. Follow all safety precautions when administering control measures.	. Describe and follow the safety factors involved in using equipment and administering control measures on weeds, pests, and diseases.	. Safety regulations and precautions described on labels are followed. . Safety factors in setting up, adjusting, and operating equipment are described and followed. . Recommended safety factors are followed when control measures are being implemented.

COMPETENCIES - HORTICULTURE TECHNOLOGY CURRICULUM

Task	Competency	Criterion Measure
D35. Have knowledge of factors affecting control measures (wind, rain, temperature, etc.).	. Describe how wind, rain, temperature, humidity, and soil conditions affect control measures on weeds, pests, and diseases.	. Control measures affected by environmental factors are described correctly by recall.
D36. Clean drainage ditches, culverts, and gutters.	. Remove leaves, trash, silt, and other materials from drainage ditches, culverts, and gutters by hand and mechanically	. Drainage ditches, culverts, and gutters are free of leaves, trash, silt, and other materials. . Tools and mechanical equipment are used and operated according to manufacturer's recommendations. . Drainage ditches, culverts, and gutters are not damaged from cleaning. . Original depths and slopes of drainage ditches are maintained.
D37. Prune and remove dead or unwanted plant branches.	. Use recommended procedures in pruning dead or unwanted plant branches and properly remove and dispose of branches.	. Dead or unwanted plant branches are correctly pruned according to recommended procedures. . Plant debris is removed without damage to the environment.
D38. Scrape plant wounds.	. Scrape and shape plant wounds using appropriate tools and recommended procedures.	. Plants wounds are correctly scraped and shaped for proper healing using recommended procedures and appropriate tools. . Reasons for scraping and shaping plant wounds are listed.

COMPETENCIES - HORTICULTURE TECHNOLOGY CURRICULUM

	Task	Competency	Criterion Measure
D39.	Apply protective substance to tree wounds or cut surfaces.	. Select and apply protective substance to tree wounds or cut surfaces.	. Protective substances are selected that properly protect plants. . Reasons for applying protective substances are listed. . Protective substances are uniformly applied to tree wounds or cut surfaces.
D40.	Prune and trim trees and shrubs at the correct time using proper equipment and methods.	. Prune plants at proper time using appropriate methods and tools.	. Correct times are identified for pruning various species of plants. . The proper pruning method is selected for the condition and type of plant. . Correct pruning procedures are followed for the selective and heading back pruning methods. . Reasons for pruning are correctly identified. . Appropriate tools are selected for the type of pruning to be done.
D41.	Prepare lawn for reseeding.	. Prepare a good seedbed by plowing, disking, tilling, raking, etc.	. Appropriate tools and equipment are selected. . The prepared seedbed is even and finely textured to a depth of 3-4 inches.

COMPETENCIES - HORTICULTURE TECHNOLOGY CURRICULUM

Task	Competency	Criterion Measure
D41. (Continued)		. The equipment used in seedbed preparation is set up and adjusted correctly to provide maximum efficiency. . Tractor operation is efficient and handling procedures listed in the operator's manual are followed. . All safety precautions are observed.
D42. Reseed, resod, or resprig a lawn.	. Reseed, resod, and resprig a lawn by adequately preparing the worn spots and using the same type grass as originally used.	. Worn spots are evenly prepared to a depth of 3-4 inches. . The same type of grass as originally used is selected. . Seeds are sown evenly and at recommended rates. . Sod is laid evenly with sides and ends fitting close together. . Sprigs are planted at the proper depth and spacing. . Lawn is adequately watered.
D43. Identify and remove poisonous plants.	. Correctly identify plants visually and by using resource materials and correctly spell the common names of selected plants. . Remove poisonous plants by hand tools, herbicides, or cultural practices.	. Selected poisonous plants are identified by common names and by using resource materials. . Common names of selected plants are spelled correctly. . Poisonous plants are killed by selecting methods that best suit the situation.

COMPETENCIES - HORTICULTURE TECHNOLOGY CURRICULUM

Task	Competency	Criterion Measure
D44. Treat plant wounds and disease infestations.	. Scrape and shape plant wounds and disease infestations using appropriate tools and recommended procedures. . Select and apply protective substance to wounds and infestations.	. Plant wounds are correctly scraped and shaped for proper healing using recommended procedures and appropriate tools. . Protective substances are selected that properly protect plants. . Protective substances are uniformly applied to wounds and infested areas.
D45. Repair worn spots in lawn with sod or reseeding.	. Prepare worn spots for reseeding or sodding. Reseed or lay sod using the same type grass as is growing in remainder of lawn.	. The prepared seedbed is even and finely textured to a depth of 3-4 inches. . Seed is sown evenly and at recommended rates. . Sod is laid evenly and level with sides and ends fitting close together. . Sod is cut to fit with border of surrounding grass. . Sod is pressed down to adhere to ground. . Seed is mulched evenly with appropriate material. . Remainder of lawn is not damaged when repairing worn spots. . Repaired area is adequately watered.

COMPETENCIES - HORTICULTURE TECHNOLOGY CURRICULUM

Task	Competency	Criterion Measure
D46. Apply lime and fertilizer according to soil test.	. Apply recommended amounts of lime and fertilizer per acre based on soil test results using calibrated equipment.	. Lime and fertilizer amounts per acre are determined according to soil test results. . Equipment is properly calibrated for application of determined rates. . Equipment is operated according to instructions found in the operator's manual. . All safety precautions are observed.
D47. Water flower beds, lawns, trees, and shrubbery.	. Water the lawn, flowers, shrubs, and trees for adequate soil moisture.	. Lawn and plants are watered only when they need to be watered. . No damage or injury is done to the lawn or plants. . The correct type of equipment is selected depending on what is to be watered. . No more water is applied at any one time than is needed to do an adequate job. . Water is evenly distributed to the area.
D48. Mow and trim lawns.	. Mow and trim lawns using properly maintained equipment.	. Lawns are mowed and trimmed to the correct height for different types of grass. . Blades are sharp and equipment is in good operating condition.

COMPETENCIES - HORTICULTURE TECHNOLOGY CURRICULUM

Task	Competency	Criterion Measure
D48. (Continued)		. Equipment is operated safely according to manufacturer's recommendations. . Lawns are edged along walks and driveways and trimmed around trees, buildings, and other obstructions.
D49. Remove dead or unwanted trees or shrubs.	. Identify unwanted shrubs and trees in an area. . Fell and remove trees and shrubs without damaging other vegetation.	. Dead or unwanted trees and shrubs are identified and marked. . Trees are cut using hand or power tools safely and efficiently. . Direction of tree fall is controlled in order to damage other trees and vegetation as little as possible. . Unwanted shrubs are cut or dug using hand or power tools safely and efficiently. . Trees and shrubs are removed from area by hand or with motorized equipment without damaging other vegetation.
D50. Cultivate flower beds.	. Cultivate flower beds using hand tools and rotary tillers.	. Flower beds are free of weeds and grass. . Plants are not damaged during cultivation.

COMPETENCIES - HORTICULTURE TECHNOLOGY CURRICULUM

Task	Competency	Criterion Measure
D50. (Continued)		. Benefits of cultivating flower beds are listed correctly. . Hand tools and power equipment are used efficiently and safely.
D51. Transplant trees and/or shrubs.	. Remove plants from original sites, place in prepared holes, and backfill holes with soil mix.	. Trees and shrubs are removed from original sites by hand or mechanically without damaging roots, foliage, stems, or trunks. . Holes are dug with the correct depth and diameter for selected plants. . The equipment is used to dig holes mechanically, is operated according to manufacturer's recommendations, and is used safely. . Post hole diggers, picks, shovels, and mattocks are used efficiently and safely. . Plants are placed straight and at the correct depth. . Plants are spaced so as not to crowd each other and are attractive. . Holes are backfilled carefully in order not to damage roots, stems, bark, or foliage.

COMPETENCIES - HORTICULTURE TECHNOLOGY CURRICULUM

Task	Competency	Criterion Measure
D51. (Continued)		. Soil mix is packed firmly under and around the plant. . A mound is constructed around the plant for adequate watering.
D52. Select and use mulches.	. Select proper mulches and mulch plantings adequately.	. Appropriate mulches are selected for designated plantings. . Designated areas are mulched at the appropriate time and to the proper depth. . Mulches are applied carefully in order not to damage plants.
D53. Repair walkways, driveways, and patios.	. Estimate costs, select materials, and repair walkways, driveways, and patios using recommended procedures.	. Necessary types and amounts of materials are chosen for the repair. . Material and labor costs are estimated. . Damaged surfaces are removed without damaging surrounding surfaces. . Damaged surfaces are repaired showing little or no change from original surfaces.

COMPETENCIES - HORTICULTURE TECHNOLOGY CURRICULUM

Task	Competency	Criterion Measure
E. Propagation		
E54. Select proper propagating stock.	. Select proper propagating stock for successful propagation of plants.	. Appropriate stock is selected that will propagate successfully. . Propagation stock is selected at the appropriate time of the year.
E55. Propagate different types of plants at the correct time using proper techniques and procedures.	. Propagate different types of plants at the correct time using recommended techniques and procedures.	. The appropriate method for propagation of selected plants is determined. . Plant material and media are properly prepared for the propagation of selected plants. . Selected plants are propagated at the correct time using recommended techniques and procedures.
E56. Have knowledge of propagating structures and equipment.	. List the characteristics of the various types of propagating structures and operate the structures and equipment.	. The types of propagating structures are listed and characteristics of each type are correctly given. . The type(s) of propagating structure is selected to best suit the needs or purposes of the situation. . Propagating structures and the supporting equipment are operated correctly to insure successful propagation of plants.

COMPETENCIES - HORTICULTURE TECHNOLOGY CURRICULUM

Task	Competency	Criterion Measure
E57. Have knowledge of propagating systems.	. Identify, install, and operate propagating systems.	. Types of propagating systems are correctly identified. . Propagating systems are installed according to manufacturer's recommendations. . The type(s) of system is selected that best fits the needs of the situation. . Propagating systems are operated properly for successful propagating of plants.
E58. Maintain and repair propagating structures and equipment.	. Maintain and repair propagating structures and equipment, using manufacturer's recommendations.	. Mechanical and structural problems are identified. . Appropriate materials, tools, and equipment are selected for repairs. . Mechanical and structural problems are properly repaired according to manufacturer's recommendations. . General maintenance program is set up and followed.
F. Greenhouse Growing of Plants		
F59. Identify media materials.	. Visually identify the various types of media materials and list the characteristics of each type.	. Types of media materials are correctly identified visually. . Characteristics of the various types of media materials are listed correctly.

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Task	Competency	Criterion Measure
F60. Shred or screen different media materials.	. Shred and screen different media material by using hand tools or mechanical equipment.	. Media materials are adequately shredded by hand tools or mechanical equipment. . Media materials are screened for sizing by using hand or mechanical screeners. . Foreign materials are identified and removed from media materials. . Mechanical equipment is operated according to manufacturer's recommendations.
F61. Determine soil mix for specific plant requirements.	. Select soil mix for specific plant requirements and mix thoroughly using hand tools or mechanical equipment.	. The soil mix for specific plant requirements is determined for optimum plant growth. . The materials are uniformly mixed by using hand tools and mechanical equipment. . Soil mixture is free of lumps, individual ingredients or foreign materials. . Mechanical equipment is operated according to manufacturer's recommendations.
F62. Sterilize mixed soils.	. Sterilize soil mixtures using chemicals and steam.	. Soil media is sterilized correctly resulting in no weed growth and no root diseases.

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Task	Competency	Criterion Measure
F62. (Continued)		. The sterilization method is selected that is most appropriate to the situation. . Recommended procedures for the different methods are followed.
F63. Apply correct amendments to soil mix.	. Select and apply amendments to soil mix by using hand tools or mechanical equipment.	. Soil amendments are selected that best meet the soil and plant requirements. . Soil amendments are uniformly mixed with the soil. . Mechanical equipment is operated according to manufacturer's recommendations. . Total soil mixture is free of lumps, individual ingredients, or foreign material.
F64. Fill benches, pots, and flats.	. Fill benches, pots, and flats with soil mix.	. Benches, pots, and flats are filled to the proper level and firmed. . Tools and equipment are used and operated efficiently according to manufacturer's recommendations.
F65. Make propagation and seed sowing schedules.	. Prepare schedules for propagating plants and for sowing seeds in accordance with space, labor, time, and plant requirements.	. Propagation and seed sowing schedules are made which coordinate available space, labor, time, and plant requirements.

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Task	Competency	Criterion Measure
F65. (Continued)		. Seed sowing schedules are coordinated with seasonal demand. . Adequate records are kept for future reference.
F66. Sow seeds in appropriate containers.	. Sow seeds in appropriate containers by hand or mechanically.	. Appropriate sowing techniques and methods are chosen for selected seeds. . Appropriate containers are selected for sowing seeds. . Seeds are sown evenly and at the proper depths.
F67. Make plant cuttings and put in appropriate containers and media.	. Take, prepare, and put cuttings in prepared containers and media.	. Cuttings from selected plants are taken at the correct time of year with established procedures for taking different kinds of cuttings followed. . Cuttings are prepared for propagation including removing leaves and stems and using rooting compound when appropriate. . Cuttings are put in containers and media using recommended procedures. . Safety practices are followed when using knives and other propagation tools.

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Task	Competency	Criterion Measure
F68. Transplant seedlings to pots, flats, etc.	. Select appropriate containers, fill to appropriate level and transplant seedlings into containers.	. Appropriate containers are selected for the various types of transplants. . Containers are filled with soil mix to within approximately ½" of top of container, and soil mix is firmed and leveled. . Small holes are made in soil mix with correct spacing and depth. . Seedlings are pulled from flat, pots, etc., inserted into prepared containers at the proper depth, and firmed in and watered without damaging the plants.
F69. Label planted specimens.	. Correctly label planted specimens.	. Planted specimens are properly labeled with the correct common and scientific names. . Labels are neat, large enough to be easily read, and contain other information when appropriate (i.e., height, light requirements, price, etc.).

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Task	Competency	Criterion Measure
F70. Properly water greenhouse stock.	. Water greenhouse stock manually and by using automatic equipment.	. Schedules for adequately watering various types of greenhouse stock are developed. . Plants are watered adequately without damaging them. . Timers are set according to established watering schedules. . Water conservation practices are followed.
F71. Prune and thin plants.	. Prune plants at correct time using recommended procedures. Thin plants by hand.	. Correct times are identified for pruning various species of plants. . Appropriate tools are selected for the type of pruning to be done. . Correct pruning procedures are followed for the method of pruning done. . Reasons for pruning are correctly identified. . The proper pruning method is selected for the condition and type of plant. . Plants are thinned to a recommended number in a specified space by removing the least desirable specimens. . Reasons for thinning plants are correctly listed.

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Task	Competency	Criterion Measure
F72. Fertilize plants.	. Apply correct amounts of fertilizer by hand and by mechanical application at the best times for optimum plant growth.	. Fertilizer schedules and rates are determined according to plant requirements. . Equipment is correctly calibrated. . Type of fertilizer and correct analysis is selected based on plant requirements and soil test results. . Fertilizer is applied without damaging the plants.
F73. Pinch potted plants.	. Pinch potted plants manually and chemically.	. Potted plants are pinched manually and chemically at the correct time without damaging plants. . Reasons for pinching plants are listed correctly.
F74. Control temperature with fans and heaters.	. Control temperature in the greenhouse by operating fans and heaters manually and by setting automatic timers.	. Temperature requirements (day/night) are determined for selected plants. . Correct temperatures are maintained by manual operation and setting automatic timers for fans and heaters.

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Task	Competency	Criterion Measure
F75. Control humidity with ventilating fans and humidifiers.	. Control humidity with ventilating fans and humidifiers by operating equipment manually and by setting automatic timers.	. Proper relative humidity level is determined for selected plants. . Proper relative humidity level is maintained by manual operation and setting automatic timers for ventilating fans and humidifiers.
F76. Control the type and amount of light.	. Control the type and amount of light necessary for greenhouse production.	. Light meters are correctly read. . Shade cloth is used at the correct time to control the amount of light required for selected greenhouse crops. . Artificial lighting (incandescent and fluorescent) is properly used to control the type and amount of light required for selected greenhouse crops.
F77. Force bulbs.	. Force bulbs (specialized stems and roots) into blooms at specified times.	. Selected specialized stems and roots are forced into bloom by the regulation of light, temperature, moisture, and nutrition.
F78. Force potted plants to bloom at seasonal times.	. Force potted plants to bloom at seasonal times.	. Selected potted plants are forced into bloom at seasonal times by the regulation of light, temperature, moisture, and nutrition.

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Task	Competency	Criterion Measure
F79. Identify weeds and control them by chemicals, plastic, and mechanical means.	. Identify and spell the common names of weeds and select appropriate control measures for their eradication.	. Selected weeds are identified by common names visually and by using resource materials. . Common names of selected weeds are spelled correctly. . Appropriate control methods are selected for the eradication of selected weeds. . Equipment is properly calibrated. . Control measures are safely and correctly applied at the correct rates for chemical controls.
F80. Fumigate greenhouse.	. Safely fumigate greenhouses using recommended procedures.	. Appropriate fumigants and fumigation methods are selected for greenhouse fumigation. . Equipment is correctly calibrated. . Fumigants are applied correctly and at the appropriate rates.
F81. Identify, remove, and destroy diseased plants.	. Identify, remove, and destroy diseased plants.	. Diseased plants are correctly identified visually and by using resource materials. . Diseased plants are removed and properly destroyed.

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Task	Competency	Criterion Measure
F82. Control plant insects and diseases with chemicals.	. Apply control measures on weeds, pests, and diseases using chemiclas and other measures where appropriate. Calibrate equipment.	. Chemical control measures are applied correctly following label instructions. . Sprayers, dusters, and foggers are operated according to manufacturer's recommendations and calibrated correctly. . Biological, cultural, sanitation, and chemical control measures are used where appropriate and recommended procedures followed. . All safety precautions are observed. . Equipment is thoroughly cleaned after each use, removing all residues.
F83. Remove plants from bed to sell.	. Remove plants from bed and place in boxes or other inexpensive containers for ease of transporting by customers.	. Plants are removed from beds very carefully in order not to damage roots or foliage. . Appropriate tools are used for removing plants. . Plants are placed in containers carefully to avoid injury.
F84. Select proper pot sizes for replanting plants.	. Select proper pots and pot sizes for replanting plants.	. Proper pots are selected for the type plants and how the plants will be used. . Proper pot sizes are selected for various plants.

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Task	Competency	Criterion Measure
G. Field Growing of Plants		
G85. Take soil sample and interpret data.	. Take soil samples according to established procedures, fill out information sheet, submit samples to a soil testing laboratory and interpret the returned results.	. Soil samples are taken according to established and approved procedures. . Information sheets are completed giving information on land use and fertilization and liming records. . Soil samples and information sheets are mailed to state or private soil testing laboratories. . Soil test results are interpreted and fertilization and liming amounts are determined.
G86. Calibrate spreader and apply fertilizer and lime according to soil test data.	. Apply recommended amounts of lime and fertilizer per acre based on soil test results using calibrated equipment.	. Lime and fertilizer amounts per acre are determined according to soil test results. . Equipment is properly calibrated for application of determined rates. . Equipment is operated according to instructions found in the operator's manual. . All safety precautions are observed.

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Task	Competency	Criterion Measure
G87. Plow, disk, level, and lay off rows for planting.	. Plow, disk, level, and lay off rows for planting.	. The prepared seedbed is even and finely textured to a depth of 3-4 inches. . The equipment used in seedbed preparation and laying off rows is set up and adjusted correctly according to field conditions. . The rows are straight, and depth and width of rows are appropriate for the plants. . Tractor operation is efficient and handling procedures listed in the operator's manual are followed. . All safety precautions in handling and operating equipment are observed.
G88. Lay off and install drainage system if needed.	. Lay off and install a drainage system in the growing field.	. The farm level or transit is used correctly to determine slope. . The drainage system is laid off for best drainage according to field conditions. . Drainage ditches are dug to the proper depth, width, and slope according to field conditions. . Hand and motorized equipment is used efficiently and operated according to recommendations found in owner's manual.

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Task	Competency	Criterion Measure
G88. (Continued)		. Size and type of drainage tile is selected that will do the best job for the situation. . Drainage tile is installed following recommended procedures. . The tile line has the proper slope or grade. . All safety precautions are observed.
G89. Install and operate irrigation system.	. Read and interpret blueprints. . Install an irrigation system to fit the requirements of the nursery. . Operate and maintain it according to manufacturer's recommendations.	. Blueprints are read and interpreted correctly. . An irrigation method is chosen that fits the needs of the nursery or the situation. . An adequate water source is used. . For a sprinkler system, proper size and type of pipe is selected to adequately feed water to all designated areas. . For a sprinkler system, pipes are installed according to manufacturer's recommendations, and risers are located to allow for small overlaps of water.

COMPETENCIES - HORTICULTURE TECHNOLOGY CURRICULUM

Task	Competency	Criterion Measure
G89. (Continued)		. Adequate size pump(s) is selected. . Pumps are installed according to manufacturer's recommendations. . For surface system, adequate size and depth of trenches are constructed for adequate irrigation. . The system of method chosen is operated according to recommendations. . The system is maintained according to recommendations.
G90. Properly plant various species of plants.	. Install plants in the field by hand or with a transplanter.	. Holes are spaced at recommended distances depending on the variety and are dug with the correct depth and width depending on the type plant and its size. . Plants are placed straight and at the correct depth. . Plants are handled carefully in order not to damage them. . Holes are backfilled carefully in order not to damage roots, stems, barks, or foliage. . A good seedbed is prepared for plants transplanted by machine. . Plants are adequately watered.

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Task	Competency	Criterion Measure
G90. (Continued)		. Equipment is operated safely and manufacturer's recommendations followed.
G91. Cultivate plants.	. Cultivate plants without covering them up and removing most of the weeds and grass.	. Plants are cultivated to the proper depth without damaging the roots. . Plants are not covered up by cultivation, but soil is placed around the base of plants. . Fields are free of weeds and grass.
G92. Develop fertilization program for maintaining plants.	. Calculate amounts of fertilizer needed according to the way the plants look and are performing and from various test reports.	. Plants are healthy, have good color and have good growth rates. . Schedules for fertilizing various varieties, sizes, and ages of plants are developed.
G93. Properly fertilize plants.	. Apply correct amounts of fertilizer by hand and by mechanical application at the best times for optimum plant growth.	. Fertilizer schedules and rates are determined according to plant requirements. . Equipment is correctly calibrated. . Type of fertilizer and correct analysis is selected based on plant requirements and soil test results. . Fertilizer is applied without damaging the plants.

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Task	Competency	Criterion Measure
G94. Prune plants at proper time using appropriate methods.	. Prune plants at proper time using appropriate methods and tools.	. Correct times are identified for pruning various species of plants. . The proper pruning method is selected for the condition and type of plant. . Correct pruning procedures are followed for the selective and heading back pruning methods. . Reasons for pruning are correctly identified. . Appropriate tools are selected for the type of pruning to be done.
G95. Identify weeds, pests, and diseases.	. Identify weeds, pests, and diseases by common name (visually or by using reference material). . Spell common names of weeds, pests, and diseases.	. Selected weeds, pests, and diseases are correctly identified by common name (visually or by using reference material). . Common names of weeds, pests, and diseases are spelled correctly.
G96. Remove dead or undesirable stock.	. Identify, remove, and destroy dead, diseased, and other undesirable stock.	. Dead, diseased, or other undesirable stock are correctly identified visually and by using resource materials. . Dead, diseased, or other undesirable stock are properly removed and destroyed.

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Task	Competency	Criterion Measure
G97. Determine methods of control needed to eradicate weeds, pests, and diseases.	. List control methods for weeds, pests, and diseases from memory or by using reference material.	. Control methods for weeds, pests, and diseases are correctly provided by recall or by using reference material.
G98. Apply appropriate control measures.	. Apply control measures on weeds, pests, and diseases using chemicals and other measures where appropriate. Calibrate equipment.	. Chemical control measures are applied correctly following label instructions. . Sprayers, dusters, and foggers are operated according to manufacturuer's recommendations and calibrated correctly. . Biological, cultural, sanitation, and chemical control measures are used where appropriate and recommended procedures followed. . All safety precautions are observed. . Equipment is thoroughly cleaned after each use, removing all residues.
G99. Know factors affecting control measures (wind, rain, temperature, etc.).	. Describe how wind, rain, temperature, humidity, and soil conditions affect control measures on weeds, pests, and diseases.	. Control measures affected by environmental factors are described correctly by recall.

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Task	Competency	Criterion Measure
G100. Follow all safety factors when administering control measures.	. Describe and follow the safety factors involved in using equipment and administering control measures on weeds, pests, and diseases.	. Safety regulations and precautions described on labels are followed. . Safety factors in setting up, adjusting, and operating equipment are described and followed. . Recommended safety factors are followed when control measures are being implemented.
G101. Dig plants properly (machine or by hand).	. Dig established plants by hand or mechanically.	. Plants are dug without damaging the roots, bark, stem, branches, or foliage. . Ball and burlap plants are dug with a firm ball, burlap pinned tightly and tied with cord if needed. . Equipment used in digging plants mechanically is operated according to manufacturer's recommendations, and recommended procedures in digging plants are followed. . Shovels, spades, and other hand equipment are properly used. . Safety precautions are observed.

Task	Competency	Criterion Measure
H. Container Growing of Plants		
H102. Select proper media and prepare media according to soil tests.	. Select a media suitable for plant growth according to requirements of the type of plant and results of soil test. . Mix the media by hand or mechanically.	. The media selected is correct for the different varieties of plants grown, resulting in good plant growth . Soil test results are interpreted correctly. . Soil and soil conditioners are uniformly mixed. . Soil mixture is free of lumps, individual ingredients, foreign material, or weed seed. . Mechanical mixers are operated according to recommended procedures.
H103. Select properly sized container.	. Select appropriately sized containers for each variety of plant grown.	. Containers are selected that provide good root development for plants and allow for good plant growth. . Containers selected are durable and are moderate in cost.
H104. Sterilize media.	. Sterilize soil mixtures using chemicals and steam.	. Soil media is sterilized correctly resulting in no weed growth and no root diseases. . The sterilization method is selected that is most appropriate to the situation.

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Task	Competency	Criterion Measure
H104. (Continued)		. Recommended procedures for the different methods are followed.
H105. Pot and repot plants properly.	. Pot and repot plants according to established procedures.	. Plants are potted at the correct depth with the top of the plant perpendicular to the soil surface so that the plants grow straight. . Plants are repotted when the pot is too small for the plant. . Plants are adequately watered after potting. . Plants are removed from pots without injuring them.
H106. Prepare the beds including drainage system.	. Prepare the growing bed for placing container stock including drainage system.	. The prepared beds are level, easily accessible and have good drainage. . Equipment used to prepare the beds is handled efficiently and safely. . The size of the beds are within recommended dimensions. . Beds are located apart for ease of travel between them with truck or tractor.

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Task	Competency	Criterion Measure
H107. Space containers in bed.	. Space plants in prepared beds according to the variety and needs of the plant.	. Plants are spaced in beds for good access and room for growth. . Plants are placed in beds quickly, in straight lines, and without injuring them.
H108. Set up and maintain irrigation system.	. Read and interpret blueprints. . Install an irrigation system to fit the requirements of the nursery and maintain the system according to manufacturer's recommendations.	. Blueprints are read and interpreted correctly. . An irrigation system is chosen that fits the needs of the nursery or the situation. . An adequate water source is located and used efficiently. . For a sprinkler system, proper size and type of pipe is selected to adequately feed water to all designated areas. . For a sprinkler system, pipes are installed according to recommendations, and risers are located to allow for small overlaps of water. . Adequately sized pump(s) is selected. . Pumps are installed according to manufacturer's recommendations.

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Task	Competency	Criterion Measure
H108. (Continued)		. For surface system, adequate size and depth of trenches are constructed for adequate irrigation. . The system is maintained according to recommendations.
H109. Operate irrigation system.	. Operate different irrigation systems.	. Irrigation systems are operated according to recommendations. . Plants are irrigated only when necessary. . Amount of water used is measured and water is cut off when adequate amount is applied.
H110. Mulch plants properly for winter protection.	. Mulch plants for winter protection using appropriate types of mulch.	. Plants are mulched with appropriate material without damaging stems or foliage. . Plants are mulched with recommended amounts of materials over and around plants.

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Task	Competency	Criterion Measure
H111. Prune plants at proper time using appropriate methods.	. Prune plants at proper time using appropriate methods and tools.	. Correct times are identified for pruning various species of plants. . The proper pruning method is selected for the condition and type of plant. . Correct pruning procedures are followed for the selective and heading back pruning methods. . Reasons for pruning are correctly identified. . Appropriate tools are selected for the type of pruning to be done.
H112. Identify weeds, pests, and diseases.	. Identify weeds, pests, and diseases by common name (visually or by using reference material). . Spell common names of weeds, pests, and diseases.	. Selected weeds, pests, and diseases are correctly identified by common name (visually or by using reference material). . Common names of weeds, pests, and diseases are spelled correctly.
H113. Remove dead or undesirable stock.	. Identify, remove, and destroy dead, diseased, and other undesirable stock.	. Dead, diseased, or other undesirable stock are correctly identified (visually or by using resource materials). . Dead, diseased, or other undesirable stock are properly removed and destroyed.

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Task	Competency	Criterion Measure
H114. Determine methods of control needed to eradicate weeds, pests, and diseases.	. List control methods for weeds, pests, and diseases from memory or by using reference material.	. Control methods for weeds, pests, and diseases are correctly provided by recall or by using reference material.
H115. Apply appropriate control measures.	. Apply control measures on weeds, pests, and diseases using chemicals and other measures where appropriate. • Calibrate equipment.	. Chemical control measures are applied correctly following label instructions. . Sprayers, dusters, and foggers are operated according to manufacturer's recommendations and calibrated correctly. . Biological, cultural, sanitation, and chemical control measures are used where appropriate and recommended procedures followed. . All safety precautions are observed. . Equipment is thoroughly cleaned after each use, removing all residues.
H116. Know factors affecting control measures (wind, rain, temperature, etc.).	. Describe how wind, rain, temperature, humidity, and soil conditions affect control measures on weeds, pests, and diseases.	. Control measures affected by environmental factors are described correctly by recall.

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Task	Competency	Criterion Measure
H117. Follow all safety factors when administering control measures.	. Describe and follow the safety factors involved in using equipment and administering control measures on weeds, pests, and diseases.	. Safety regulations and precautions described on labels are followed. . Safety factors in setting up, adjusting, and operating equipment are described and followed. . Recommended safety factors are followed when control measures are being implemented.
I. Building and Equipment Maintenance		
I118. Keep storage, delivery area, display area, nursery, greenhouse, salesroom, and other facilities neat and clean.	. Keep storage, delivery area, display area, nursery, greenhouse, salesroom, and other facilities neat and clean.	. All facilities are kept free of dirt and trash with materials and plants well organized for easy access and pleasant working conditions.
I119. Clean and sharpen hand tools.	. Clean and sharpen hand tools using cleansing agents, hand files and emory wheels.	. Hand tools are properly cleaned and sharpened, with cutting edges beveled to the correct angles.

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Task	Competency	Criterion Measure
I120. Develop light maintenance schedule for business vehicles, tractors, lifts, and other equipment (oil, lubrication, tire pressure, battery, brake fluid, radiator, etc.).	. Develop light maintenance schedule for business vehicles, tractors, lifts, and other equipment; also oil, lubricate, check tire pressure, battery, brake fluid, radiator, etc.	. A routine light maintenance program check is developed for business vehicles and equipment in accordance with manufacturer's recommendations. . Vehicles and equipment are properly lubricated. . Fluid levels, pressures, and tensions are properly adjusted and maintained.
I121. Tune up business vehicles, tractors, lifts, and other equipment as needed.	. Determine when to tune up vehicles; replace and gap spark plugs; replace and gap points; replace condensors; set timing; replace PCV valves and air filters.	. Determination of when to tune up vehicles is made when operation of vehicles becomes inefficient. . Spark plugs are removed, new plugs selected, gaped, and installed properly. . Points are removed and new ones are selected, gaped, and installed properly. . Condensors are removed and new ones are selected and installed properly. . Timing is set according to manufacturer's recommendations. . PCV valves are removed and new ones are selected and installed properly. . Air filters are removed and new ones are selected and installed properly.

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Task	Competency	Criterion Measure
I122. Repair display cases, storage shelves, slathouses, greenhouses, storage buildings, etc.	. Repair display cases, storage shelves, slathouses, greenhouses, storage buildings, etc. using basic carpentry skills.	. Repair needs are identified. . Appropriate materials, tools, and equipment are selected for use in repairing facilities. . Repairs are properly performed with tools and equipment that are used correctly and efficiently.
I123. Maintain and repair small gas engines, duster, sprayers, climbing equipment, etc.	. Maintain and repair small gas engines, dusters, sprayers, climbing equipment, etc. using recommended procedures.	. Maintenance and repair needs are identified. . Appropriate materials, tools, and equipment are selected for repairs. . Repairs are properly performed. . General maintenance schedule is set up and implemented.
I124. Glaze windows.	. Glaze windows (screening) on greenhouses to keep plants from receiving too much direct sun.	. Selected glazing materials are correctly identified. . Glazing materials are selected that are best for selected greenhouses and plants grown. . Glazing materials are properly and evenly applied to the greenhouse. . Proper equipment is selected, used efficiently, and cleaned after use.

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Task	Competency	Criterion Measure
I125. Paint buildings, shelves, bins, etc.	. Paint, stain, and otherwise coat facilities using brushes, rollers, and sprayers.	. Appropriate covering material is selected for the job. . Appropriate brushes, rollers, and sprayers are selected for the job. . Materials are properly mixed and prepared. . Area is scraped, washed, and otherwise prepared for coating. . Structures are evenly and thoroughly covered with no runs. . Tools, equipment, and work area are thoroughly cleaned.
I126. Recover greenhouses.	. Recover greenhouses using all types of materials and appropriate tools and equipment.	. Area is measured accurately. . Amount of materials is estimated accurately. . Appropriate tools and materials are selected. . Old or damaged covering is removed. . Area is cleaned and repairs made to greenhouse frame if needed. . Area is properly prepared for type of covering installed . Covering material is properly and efficiently installed.

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Task	Competency	Criterion Measure
J. **Equipment**		
J127. Operate efficiently all equipment used in the nursery (tractors, tractor implements, plant augers, plant diggers, trenchers, front-end loaders, trucks, soil mixers, potting machines, etc.).	. Operate vehicles and equipment used in the nursery industry safely and efficiently.	. Vehicles and equipment are identified correctly. . All safety precautions are observed when operating vehicles and equipment. . Vehicles and equipment are operated according to recommendations of the manufacturer and material given in the owner's manual. . Appropriate vehicles and equipment are selected for the tasks to be completed.
J128. Follow safety precautions for all equipment.	. Operate all vehicles and equipment safely and use safety shields and other safety devices where applicable.	. All vehicles and equipment are operated safely, following manufacturer's precautions and warnings. . Safety shields and devices located on vehicles and equipment are used, checked periodically, and adjustments are made if needed. . OSHA regulations are followed where appropriate.
J129. Determine appropriate equipment to use for various jobs.	. Select the equipment that performs the required jobs efficiently, safely, and economically.	. The correct size and type of equipment is selected for identified jobs. . The amount of equipment needed for identified jobs is estimated accurately.

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Task	Competency	Criterion Measure
J130. Make minor changes to agricultural and industrial equipment to adapt it to the nursery operation.	. Make minor changes to agricultural and industrial equipment to adapt it to the nursery operation.	. Equipment adaptations are identified that better fit the needs of the industry. . Appropriate materials are selected for equipment modifications. . Equipment is properly modified to adapt to nursery usage.
J131. Make minor equipment repairs.	. Make minor equipment repairs using appropriate tools and recommended procedures.	. Needed equipment repairs are correctly identified. . Equipment is repaired correctly following recommended procedures.
K. Construction		
K132. Apply basic carpentry skills in building display beds, slathouses, storage sheds, greenhouses, and other construction projects.	. Use basic carpentry skills in building display beds, slathouses, storage sheds, greenhouses, and other construction projects under the supervision of a skilled carpenter.	. Construction plans are correctly read and interpreted. . Carpentry tools are correctly identified. . Appropriate materials and tools are chosen and prepared for building the construction project. . The project is correctly constructed to meet plan requirements.

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Task	Competency	Criterion Measure
K133. Install fences using different types of materials.	. Install fances using various types of materials and techniques.	. Construction plans are correctly read and interpreted. . Appropriate fence type and materials are selected. . Area and materials are prepared for installation. . Fence is constructed and finished to meet plan requirements.
K134. Install walls using railroad ties, block, brick, rock, or other materials.	. Construct walls using railroad ties, block, brick, rock, or other materials by following recommended procedures.	. Construction plans are correctly read and interpreted. . Appropriate materials are selected. . Area and materials are properly prepared for wall installation. . Walls are constructed and finished to meet plan requirements.
K135. Construct planters.	. Construction planters by following prepared blueprints and utilizing proper construction techniques.	. Construction plans are correctly read and interpreted. . Appropriate materials are selected.

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Task	Competency	Criterion Measure
K135. (Continued)		. Materials are measured and cut accurately for construction. . Planters are correctly constructed and finished to meet plan requirements.
K136. Construct garden bench seats.	. Construct garden bench seats by following prepared blueprints and utilizing proper construction techniques.	. Construction plans are correctly read and interpreted. . Appropriate materials are selected. . Materials are measured and cut accurately. . Benches are correctly constructed and finished to meet plan requirements.
K137. Install walks and patios using brick, concrete, and other materials.	. Install walks and patios using brick, concrete, and other materials by following blueprints and utilizing accepted construction techniques.	. Construction plans are correctly read and interpreted. . Appropriate materials are selected. . Area and materials are properly prepared for installation. . Walks and patios are correctly installed and finished to meet construction requirements.

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Task	Competency	Criterion Measure
K138. Erect suitable lighting for recreation and garden areas.	. Install suitable lighting for recreation and garden areas.	. Appropriate type of lighting system is selected for area. . Appropriate type of lighting system is correctly designed for location. . Appropriate materials are selected. . Area and materials are properly prepared for installation. . Lighting system correctly installed to meet plan requirements and passes electrical inspection.
K139. Install proper edging for various landscape areas.	. Prepare the area and install edging for various landscape areas.	. Appropriate type of edging is selected for landscape areas. . Appropriate materials are selected. . Area and materials are prepared for installation. . Edging is installed following recommended procedures.

COMPETENCIES - HORTICULTURE TECHNOLOGY CURRICULUM

Task	Competency	Criterion Measure
K140. Construct rock gardens and other specialized areas.	. Construct rock gardens and other specialized areas following construction plans and recommended procedures.	. Construction plans are correctly read and interpreted. . Appropriate construction and plant materials are selected for area. . Area and materials are properly prepared for construction. . Area and plants are correctly constructed and installed to meet plan specifications.
L. Advertising and Selling Plants		
L141. Advertise products effectively through newspapers, magazines, sales, leaflets, radio, television, store displays, special displays, etc.	. Advertise products effectively through newspapers, magazines, sales, leaflets, radio, television, store displays, special displays, etc.	. The ad is eye-catching. . The ad is appropriate for the product. . The ad utilizes the appropriate media. . The ad increases the amount of products sold. . The ad increases the number of customers in the establishment.

COMPETENCIES - HORTICULTURE TECHNOLOGY CURRICULUM

Task	Competency	Criterion Measure
L142. Use supplier advertising materials effectively.	. Utilize supplier prepared materials to supplement advertising efforts.	. The materials are attractive. . The materials fit in with owner materials. . Appropriate media is used for ads.
L143. Identify customer needs and wants.	. Identify plants and other needs and desires of the customer.	. Material identified satisfies the customer sufficiently to create desire to purchase. . Material identified fits into the customer's landscape scheme or design. . Customers are treated courteously at all times.
L144. Describe to customer the purpose and qualities of merchandise for sale.	. Describe the purposes and qualities of merchandise to prospective buyers.	. The merchandise is described accurately. . The purposes are stated clearly. . The qualities are stated truthfully.
L145. Take orders for sales or service by telephone.	. Accurately take telephone orders for sales or service.	. Orders are accurately recorded. . Good telephone manners are exhibited.

COMPETENCIES - HORTICULTURE TECHNOLOGY CURRICULUM

Task	Competency	Criterion Measure
L146. Quote cost of plants.	. Quote cost of plants to customers from recall or by using price lists.	. Cost of plants are accurately quoted to customers by recall and by using price lists.
L147. Make cost estimates on customer orders.	. Estimate final costs on customer orders.	. The estimated cost of materials is reasonably close to actual cost. . The estimated cost of installation is reasonably close to actual cost. . The markup includes all pertinent components.
L148. Use effective interpersonal relationships in dealing with customers.	. Effective interpersonal relationships are demonstrated in dealing with customers.	. Courteousness, tactfulness, and truthfulness are practiced at all times. . Ethical behavior is demonstrated constantly.
L149. Label and price mark merchandise.	. Label and price mark merchandise correctly.	. The label and price are accurate. . The label and price are legible. . The label and price are attached securely.
L150. Display store merchandise for sale.	. Display merchandise for sale.	. The merchandise is arranged attractively. . The display attracts attention.

COMPETENCIES - HORTICULTURE TECHNOLOGY CURRICULUM

Task	Competency	Criterion Measure
L150. (Continued)		. The display is located conveniently to customer traffic. . The display increases customer purchases of merchandise.
L151. Wrap and/or package merchandise sold.	. Wrap and/or package items sold.	. The wrapping is secure. . The wrapping is appropriate for the product. . The wrapping prevents damage to the product.
L152. Deliver or ship merchandise sold.	. Deliver or ship purchased items to the correct address.	. Correct information is obtained from customer. . The merchandise is properly wrapped. . The merchandise is labeled for delivery/shipping. . The merchandise is delivered to the correct address.
L153. Rent equipment to customers.	. Rent lawn and garden equipment to customers.	. Proper equipment for the job is rented. . Forms are properly completed. . Customers are treated courteously.

COMPETENCIES - HORTICULTURE TECHNOLOGY CURRICULUM

Task	Competency	Criterion Measure
L154. Follow up sales to determine customer satisfaction.	. Customers contacted to determine degree of satisfaction from merchandise bought.	. The follow-up is done in a friendly manner. . Accurate information is obtained upon which to base valid decisions. . The data is accurately compiled.
L155. Prepare and keep current price lists and sales catalogs.	. Prepare and update price lists and catalogs as needed to keep customers informed.	. The price lists/catalogs are comprehensive. . The price lists/catalogs are accurate. . The price lists/catalogs are easily read and understood.
L156. Suggest to customers plant materials to be used under their situations.	. Suggest plant materials to be used under the situations customers describe.	. Pertinent questions are asked customers to obtain needed information. . Customers are treated courteously. . The suggestions are appropriate.
L157. Read and interpret landscape plans drawn by designers and architects architects.	. Read and interpret landscape plans drawn by landscape designers/architects.	. Plants are identified accurately. . Symbols are read accurately. . The scale and legend are read accurately.

COMPETENCIES - HORTICULTURE TECHNOLOGY CURRICULUM

Task	Competency	Criterion Measure
L157. (Continued)		. Specifications are determined correctly. . Landscape plans are interpreted correctly.
L158. Develop and verify customer directories.	. Develop and verify customer directories.	. The directory is complete. . The directory is accurate. . The directory is current. . The directory is neat and easily readable. . The directory is verified by various acceptable methods.
L159. Use cash register, adding machine, calculator, and other recording devices.	. Operate cash register, adding machine, and calculator to figure customers' bills and make cash and charge transactions.	. Machines are operated accurately and efficiently. . Cash and charge transactions are figured accurately with tickets and receipts completed correctly.
L160. Advise customers on fertilization, disease, and insect control on current information.	. Advise customers on fertilization, disease, insect control on plants purchased, and on other plants customer requests information on.	. The advice is accurate and up to date. . Sources of additional information are provided.
L161. Answer customer complaints.	. Answer customer complaints quickly and accurately, being courteous to the customer at all times.	. The complaint is answered courteously. . The complaint is handled promptly.

COMPETENCIES - HORTICULTURE TECHNOLOGY CURRICULUM

Task	Competency	Criterion Measure
L161. (Continued)		. The information provided is correct. . The supervisor is notified immediately when information is now known or not available quickly.
L162. Write up customer orders.	. Write up orders for merchandise purchased.	. The items are identified properly. . The necessary descriptive information is included. . The quantities are correct. . The prices are correct. . The sales tax is accurate.
L163. Water and properly care for plants on display and/or storage.	. Water, fertilize, weed, stake, prune, and provide correct environment for plants in the business establishment that are stored or on display to maintain healthy stock.	. The plants are watered periodically to prevent wilting and other damage. . The plants are fertilized to maintain growth and healthy appearance. . The plants are weeded for attractive appearance. . The plants are pruned as needed to maintain proper growth habits. . The plants are staked as needed to maintain proper growth habits. . The plants are provided with proper light and temperature for healthy appearance.

COMPETENCIES - HORTICULTURE TECHNOLOGY CURRICULUM

Task	Competency	Criterion Measure
L164. Repair or reball balled and burlapped plants.	. Repair and reball balled and burlapped plants to meet customer satisfaction.	. The reballed or burlapped plant is securely held. . The reballed or reburlapped plant is firm.
L155. Properly handle and load carts, trailers, trucks, or other vehicles for transportation of plants within the nursery and to delivery points.	. Handle and load plants onto carts, trailers, trucks, or other vehicles without damaging plants and secure plants on vehicle.	. The plants are lifted without damaging roots, stems, or foliage. . The plants are loaded onto vehicles and stacked without damaging them. . The plants are secured without damage and will not shift during transporting.
M. Records		
M166. Take periodic inventory.	. Understand, apply, and complete inventory forms.	. Specific inventory forms necessary for given time period are determined. . Inventory forms are completed accurately and legibly. . Reasons for taking inventory are listed correctly.
M167. Keep records of receipts and expenses.	. File and provide data periodically on receipt and expense records according to sales, purchases, public relations, and other needed categories.	. Receipt and expense records are filed correctly according to pre-established categories.

Task	Competency	Criterion Measure
M167. (Continued)		. Expense and receipt data. . Accurate summary data is provided periodically on sales and purchase records.
M168. Prepare and mail bills to collect accounts receivable.	. Prepare and mail bills to collect accounts receivable.	. Bills are prepared on proper forms. . Bills are accurate with correct mailing address listed. . Bills are mailed at end of month or with as little lag time as possible between purchase and billing. . Follow-up letters are justifiable, being specific with penalties adequately described.
M169. Keep employee work records.	. Use necessary forms for maintaining work records of employees, record data, and keep accurate files.	. Adequate employee work record forms are used to obtain necessary information. . Employee attendance records are kept daily and accurately recorded on forms. . Employee progress records are correctly completed from information provided and filed alphabetically by employee name. . Work records are filed alphabetically by employee name.

COMPETENCIES - HORTICULTURE TECHNOLOGY CURRICULUM

Task	Competency	Criterion Measure
M170. Prepare employee payroll.	. Obtain necessary information to prepare employee payrolls.	. All information needed to prepare employee payrolls is obtained from appropriate forms. . Gross salary is accurately determined. . All deductions are accurately determined. . Net salary is accurately determined. . Information is recorded on forms for filing and for reporting of withheld funds to state and federal agencies.
M171. Assist in records audit.	. Assists auditor by providing records and needed information for auditing purposes.	. Records are made readily available for auditor. . Necessary additional computations are made and provided to auditor. . Necessary resources (personnel, form examples, books, etc.) are provided to the auditor.

COMPETENCIES - HORTICULTURE TECHNOLOGY CURRICULUM

Task	Competency	Criterion Measure
M172. Prepare income tax and other necessary reports.	. Prepare income tax forms and other necessary reports. . Mail to proper locations by required filing dates.	. Income tax forms are completed accurately (state and federal). . Estimated tax forms, workman compensation forms, social security forms, and other required state and/or federal forms are completed accurately. . Filing dates for required forms are listed correctly. . All forms are mailed to correct location.
M173. Keep annual depreciation schedule.	. Prepare annual depreciation schedules on equipment, buildings, etc.	. Depreciation schedules are determined that will allow for the best tax credits or will fit the business needs best. . Depreciation schedules are accurately calculated.
M174. Develop customer credit records.	. Develop or adapt a system of keeping accurate customer records and demonstrate how to use the system..	. A credit record system is developed or adapted from other systems already developed. . The system used is simple and information is readily available.

COMPETENCIES - HORTICULTURE TECHNOLOGY CURRICULUM

Task	Competency	Criterion Measure
M170. Prepare employee payroll.	. Obtain necessary information to prepare employee payrolls.	. All information needed to prepare employee payrolls is obtained from appropriate forms. . Gross salary is accurately determined. . All deductions are accurately determined. . Net salary is accurately determined. . Information is recorded on forms for filing and for reporting of withheld funds to state and federal agencies.
M171. Assist in records audit.	. Assists auditor by providing records and needed information for auditing purposes.	. Records are made readily available for auditor. . Necessary additional computations are made and provided to auditor. . Necessary resources (personnel, form examples, books, etc.) are provided to the auditor.

COMPETENCIES - HORTICULTURE TECHNOLOGY CURRICULUM

Task	Competency	Criterion Measure
M172. Prepare income tax and other necessary reports.	. Prepare income tax forms and other necessary reports. . Mail to proper locations by required filing dates.	. Income tax forms are completed accurately (state and federal). . Estimated tax forms, workman compensation forms, social security forms, and other required state and/or federal forms are completed accurately. . Filing dates for required forms are listed correctly. . All forms are mailed to correct location.
M173. Keep annual depreciation schedule.	. Prepare annual depreciation schedules on equipment, buildings, etc.	. Depreciation schedules are determined that will allow for the best tax credits or will fit the business needs best. . Depreciation schedules are accurately calculated.
M174. Develop customer credit records.	. Develop or adapt a system of keeping accurate customer records and demonstrate how to use the system..	. A credit record system is developed or adapted from other systems already developed. . The system used is simple and information is readily available.

COMPETENCIES - HORTICULTURE TECHNOLOGY CURRICULUM

Task	Competency	Criterion Measure
M175. File records and other materials.	. File records and all other materials accurately using an established or accepted filing system.	. The records are filed with 100% accuracy. . The filing system is simple with ease of retrieving information.
M176. Develop adequate record system for ordering and restocking plants, materials, pricing, determining quantities for production and for profit analysis.	. Develop or adapt a system of keeping records for ordering and restocking plants, materials, pricing, determining quantities for production and for profit analysis.	. Plants are ordered and restocked when inventories decrease to a specified level. . Materials are ordered and restocked when inventories decrease to a specified level. . Prices of plants are periodically examined and changed as costs increase. . Production quantities are periodically examined and adjusted according to supply and demand. . Income and expenses on each enterprise engaged in are periodically examined and analyses made to determine profit or loss.

COMPETENCIES - HORTICULTURE TECHNOLOGY CURRICULUM

Task	Competency	Criterion Measure
M177. Keep maintenance and repair records on equipment.	. Keep maintenance and repair records on equipment.	. Maintenance and repair records on equipment are kept accurately. . Maintenance and repair records on equipment are filed accurately for easy reference.
N. Inventory		
N178. Keep current inventory of merchandise for sale.	. Take inventory of merchandise for sale and keep inventory records current.	. Inventory of saleable merchandise is taken periodically. . Inventory information is recorded neatly and accurately. . Inventory records for pricing, sales, and business transactions are filed and available for future reference.
N179. Check received merchandise against invoice listings.	. Check received merchandise against invoice listings.	. Invoices are read, and shipment quantities and descriptions are checked against invoice listings.
N180. Check invoices for errors.	. Check invoices for errors.	. Invoices are read and cross-referenced for accuracy. . Numbers received and numbers listed are calculated and corrections made.

COMPETENCIES - HORTICULTURE TECHNOLOGY CURRICULUM

Task	Competency	Criterion Measure
N180. (Continued)		. Shippers and manufacturers are contacted about discrepancies.
N181. Store received merchandise.	. Store received merchandise.	. Received merchandise is stored in an orderly and functional manner without damage.
N182. Order replacement and/or new merchandise.	. Order replacement and/or new merchandise.	. Merchandise needs are analyzed. . Catalogs and sales lists are used for obtaining correct prices and order numbers. . Order forms are filled out and submitted, or telephone requests are made to manufacturer or distributor.
N183. Arrange for transportation of materials purchased.	. Arrange for transportation of materials purchased.	. Appropriate mode of transportation is selected for various types of materials. . Transportation arrangements are made with shipper.

COMPETENCIES - HORTICULTURE TECHNOLOGY CURRICULUM

Task	Competency	Criterion Measure
N184. Order repair parts for business vehicles and equipment.	. Order repair parts for business vehicles and equipment.	. Repair parts' needs are analyzed. . Catalogs and sales lists are used for obtaining correct prices and order numbers. . Order forms are filled out and submitted, or telephone requests are made to manufacturer or distributor.
O. Management		
O185. Identify labor needs.	. Identify labor needs for landscape and/or greenhouse work.	. Labor needs are estimated accurately for landscape and greenhouse operations.
O186. Determine kinds and amounts of equipment to buy and stock.	. Identify equipment and supply needs and determine types and quantities to buy and stock.	. Equipment and supply needs are identified for selected business operations. . Types and quantities of equipment and supplies to buy and stock are determined based on present and future needs.
O187. Identify and select producers and suppliers of plants, equipment, supplies, etc.	. Identify and select producers and suppliers of plants, equipment, supplies, etc.	. Producers and suppliers are identified by appropriate methods. . Producers and suppliers are selected based on reputable sources of information.

COMPETENCIES - HORTICULTURE TECHNOLOGY CURRICULUM

Task	Competency	Criterion Measure
0188. Select and purchase equipment, supplies, etc.	. Identify equipment and supply needs and determine types and quantities to buy and stock.	. Equipment and supply needs are identified for selected business operations. . Types and quantities of equipment and supplies to buy and stock are determined based on present and future needs.
0189. Enforce safety regulations.	. Enforce safety regulations through seminars or workshops with supervisors and/or employees.	. Supervisors and/or employees are periodically checked to determine if they are following safety precautions; irregularities found are reported in written form. . Supervisors and/or employees are supervised daily to encourage safety consciousness.
0190. Recruit and select employees.	. Recruit, interview, and select employees based on needed qualifications.	. Employee positions are advertised by legal and ethical methods. . Prospective employees are interviewed using accepted interviewing techniques. . Employees are selected for positions based on needed qualifications.

COMPETENCIES - HORTICULTURE TECHNOLOGY CURRICULUM

Task	Competency	Criterion Measure
0191. Train employees.	. Set up a training program for new employees and an ongoing inservice program.	. A thorough and effective training program is developed for training new employees for selected jobs. . An ongoing inservice program is developed for keeping all employees current and motivated.
0192. Designate employee work assignments.	. Designate employee work assignments.	. Selected job requirements are defined, and employee skills and expertise are matched to work requirements.
0193. Supervise employees.	. Supervise employees to improve their performance are job satisfaction, and provide safe work conditions.	. Employees are properly supervised for quality, efficiency, and safe work habits.
0194. Evaluate employee performance.	. Develop evaluation procedure and objectively evaluate employee performance.	. An evaluation procedure is developed that is practical, objective, and fair and meets the needs of the business operation. . Employee performance is objectively evaluated based on the established criteria for the job and utilizing the developed evaluation procedure.

COMPETENCIES - HORTICULTURE TECHNOLOGY CURRICULUM

Task	Competency	Criterion Measure
0195. Perform personnel actions such as promoting, firing, disciplinary actions, etc.	. Establish personnel regulations and perform personnel actions such as promoting, firing, disciplinary action, etc.	. Personnel regulations are established that are practical and meet the needs of the business operation. . Personnel actions are performed as indicated in the personnel regulations or as situations demand.
0196. Establish employee wages, hours, and working conditions.	. Establish employee wages, hours, and working conditions.	. Employee wages, hours, and working conditions are established for specific job situations that are practical. . An appropriate (daily, weekly, monthly) work schedule is developed for employee work assignments.
0197. Administer social security and other employee benefit programs.	. Administer social security and other employee benefit programs.	. Appropriate agencies and companies are contacted about employee benefit programs. . Benefit programs are thoroughly explained to employees. . Appropriate forms are correctly completed and submitted to agencies and companies.

COMPETENCIES - HORTICULTURE TECHNOLOGY CURRICULUM

Task	Competency	Criterion Measure
0198. Knowledge of business laws, taxes, and laws pertaining to hiring, paying, and treating employees.	. Apply business laws, tax laws, and laws pertaining to hiring, paying, and treating employees to the business operation.	. The business operation is complying with all business laws concerning development, expansion, and the daily operation of the business. . All tax laws concerning the business operation are being complied with. . All laws concerning the hiring, paying, and treating of employees are being complied with.
0199. Analyze new products and plants to determine if they need to be added to the sales lines.	. Determine if new products and plants need to be added to the sales lines.	. An experimental sales plan is designed for new products and plants to assist in making decisions on what should be added to the sales line. . New products and plants that are selected for sales lines maintain an investment compared to other sales items over a specified period of time.
0200. Analyze current market trends and expansion possibilities.	. Obtain the needed information to analyze current market trends and expansion possibilities.	. Current market trends are identified and analysis made based on available information concerning possible expansion of product lines.

COMPETENCIES - HORTICULTURE TECHNOLOGY CURRICULUM

Task	Competency	Criterion Measure
0201. Determine need for, select reputable insurer, and purchase comprehensive business insurance.	. Determine the need for business insurance, select a reputable insurance company, and purchase comprehensive business insurance.	. Appropriate insurance needs are identified for selected business operations. . Reputable insurance company is selected and appropriate types and amounts of insurance is purchased to cover identified risks.
0202. Estimate costs of projects and make proper bids.	. Analyze component parts of projects, estimate costs of each component, and submit proper bids.	. Costs for selected projects are accurately estimated based on project analysis. . Bids are properly submitted on prepared forms or in an acceptable format.
0203. Carry out or implement landscape design plans.	. Install landscape design from a prepared plan.	. Landscape design plans are correctly read and interpreted. . A designated landscape site is properly prepared. . Plants and construction specifications are properly installed. . The landscape job is cleaned up and inspected for accuracy.

COMPETENCIES - HORTICULTURE TECHNOLOGY CURRICULUM

Task	Competency	Criterion Measure
0204. Determine appropriate plant replacements if specified plants are not available in landscape plan.	. Select appropriate plant replacements when specified plants are not available.	. Plant substitutes are chosen that create the same or very similar results that were desired for the specified plants in the plan.
0205. Determine business credit needs.	. Analyze the business assets, liabilities, expansion plans, profits, and current credit and determine additional credit needs.	. Business assets are correctly identified. . Business liabilities are correctly identified. . Profits are correctly calculated. . Current credit use is correctly determined. . Projections for additional credit needs are determined based on identified financial situations and expansion plans.
0206. Locate sources of and secure credit.	. Identify credit sources, analyze alternative choices and secure the type of credit best suited for the business.	. Credit sources are correctly identified. . Types of credit and alternative payment plans are correctly determined and analyzed. . Credit is chosen that best fits the business situation.

COMPETENCIES - HORTICULTURE TECHNOLOGY CURRICULUM

Task	Competency	Criterion Measure
0206. (Continued)		. Application forms are correctly completed and final transactions made.
0207. Prepare, negotiate, and implement sales contracts.	. Prepare, negotiate, and implement sales contracts.	. Sales contracts are correctly prepared and negotiated. . The implementation phase of sales contracts is correctly carried out.
0208. Allocate monies in preparing budget.	. Develop a budget for a fiscal year for a business based on past financial records and current information.	. Financial records of the business are analyzed and appropriate computations made for making decisions on allocation of monies. . Budgeting methods are identified and procedures outlined. . The type of budget is chosen that best fits the business operation. . Budget forms and entries are identified. . A budget is prepared based on priorities and financial records.

COMPETENCIES - HORTICULTURE TECHNOLOGY CURRICULUM

Task	Competency	Criterion Measure
0209. Analyze business enterprises on cost and return basis.	. Compute net profit of business plus profits on separate enterprises of the business.	. Business costs and returns are identified. . Net profits are correctly computed on the total business and also on separate enterprises. . Ratio of costs and returns are correctly computed on the entire business and on separate enterprises.
0210. Arrange trade-ins and credit terms.	. Appraise equipment and materials, negotiate trade-ins and arrange credit terms.	. Horticultural equipment and materials are appraised accurately. . Trade-ins are negotiated courteously, efficiently, and fairly. . Credit terms for total trade-in price and purchases are correctly arranged and computed.
0211. Check credit references of customers.	. Check credit references of customers.	. Credit references of customers are correctly identified. . Credit bureaus are identified and their services used correctly. . Appropriate credit reference inquiries are made.

COMPETENCIES - HORTICULTURE TECHNOLOGY CURRICULUM

Task	Competency	Criterion Measure
P. Designing a Landscape		
P212. Identify and use drafting equipment.	. Correctly identify drafting equipment and use drafting equipment to make simple drawings neatly and accurately.	. Drafting equipment is correctly identified. . Drafting equipment is used correctly to make drawings neatly and accurately.
P213. Develop knowledge of landscape symbols.	. Correctly identify landscape design symbols.	. Landscape design symbols are correctly identified.
P214. Key and letter a drawing.	. Correctly key and letter drawings.	. Drawings are correctly and clearly keyed. . Drawings are correctly and neatly lettered.
P215. Consult with client to determine his needs and wishes.	. Determine the type or extensiveness of the landscape design needed or desired from clients.	. Clients are consulted using courtesy and respect. . Appropriate questions are asked clients to determine their needs and wishes. . Written check-off lists are administered to clients and the lists are analyzed to determine needs and desires.

COMPETENCIES - HORTICULTURE TECHNOLOGY CURRICULUM

Task	Competency	Criterion Measure
P216. Survey the landscape area.	. Survey the area to be landscaped to determine dimensions, locate landscape features and determine where plants are needed.	. The dimensions of the landscape area are correctly determined. . The landscape features are correctly located. . Locations where plants are needed are determined.
P217. Locate existing water and sewer lines in landscape areas.	. Locate existing water and sewer lines in landscape areas.	. Blueprints are read and interpreted correctly to locate existing water and sewer lines.
P218. Develop landscape design by using principles and techniques that fit the job.	. Prepare a landscape design that fits the situation.	. The prepared design is neat, accurate and practical for the situation. . Plants are selected that are available in the region and are suited for the selected site. . The design exhibits unity and balance.
P219. Select appropriate plant materials for the design.	. Select appropriate plant materials for the landscape design.	. The plant materials selected are suitable for the site selected in the design. . Costs of the selected plants are reasonable. . Plants selected are readily available.

COMPETENCIES - HORTICULTURE TECHNOLOGY CURRICULUM

Task	Competency	Criterion Measure
P220. Estimate labor in terms of numbers of men and hours.	. Estimate labor requirements for specific jobs in terms of number of workers and hours.	. The number of workers and the total number of hours required to complete specific jobs are accurately estimated.
P221. Prepare cost estimate of plan.	. Prepare cost estimate of the landscape design plan.	. Cost estimate is correctly and thoroughly prepared for a landscape job.
Q. Professional Improvement		
Q222. Be familiar with various professional and trade associations and make decision about membership in these organizations.	. Identify and select appropriate professional associations for membership.	. Horticulture professional associations are correctly identified. . The purposes and activities of each professional horticulture association are correctly listed. . Procedures for joining various professional associations are listed.
Q223. Be aware of how and where to find current information on plant diseases, pesticides, new plants and varieties, insects, equipment, etc.	. Locate information on plant diseases, pesticides, new plants and varieties, insects, equipment, etc.	. Information on plant diseases, new plants and varieties, insects, chemicals, equipment, etc. are correctly and efficiently located.

COMPETENCIES - HORTICULTURE TECHNOLOGY CURRICULUM

Task	Competency	Criterion Measure
Q224. Have knowledge of and subscribe to various professional and trade publications.	. Identify and subscribe to various professional and trade publications.	. Professional and trade publications are correctly identified. . The type of information found in professional and trade publications is listed. . Procedures for subscribing to professional and trade publications are listed.

Appendix F

ANALYSIS

CURRICULUM: Horticulture Technology

SUBJECT AREA: Plant Identification and Cultural Requirements

TASK: (No. A1) Identify plants by common and scientific name (annuals, biennials, perennials, etc.).

COMPETENCY: Correctly identify plants by their common and scientific names and correctly spell the common and scientific names of identified plants.

CRITERION MEASURE:
1. Selected plants are correctly identified by common and scientific names.
2. Common and scientific names of selected plants are spelled correctly.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Identify plants.	I. Plant classification A. Herbaceous B. Woody 1. Deciduous 2. Evergreen II. Identification characteristics A. Flower B. Stem 1. Branching habit 2. Structures 3. Surface 4. Pith C. Bark D. Buds E. Fruit F. Leaf 1. Arrangement	I. Satisfaction of gaining knowledge of plant identification. II. Relates to others in plant field. III. Chooses plants for personal satisfaction. IV. Asks questions concerning plant characteristics of unknown plants. V. Alert to odd or unusual plants.

OUTLINE OF INSTRUCTIONAL CONTENT (CONTINUED)

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
	2. Venation 3. Shape 4. Surface G. Other (i.e. flavor, odor)	
II. Spell plant names (common and scientific).	III. Spelling techniques A. Memorization B. Association C. Spelling rules D. Latin usage	

ANALYSIS

CURRICULUM: Horticulture Technology

SUBJECT AREA: Plant Identification and Cultural Requirements

TASK: (No. A2) Use resource material to identify unknown plants which cannot be identified by visual inspection.

COMPETENCY: Correctly identify selected plants by their common and scientific names by using resource materials.

CRITERION MEASURE: Selected plants are correctly identified by their common and scientific names using resource materials.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Identify plants by using resource materials.	I. Kinds of resource materials and how to use them A. Plant keys B. Books C. Trade magazines D. People E. Trade catalogs F. Scientific publications II. Plant characteristics for identification purposes A. Flower B. Stem C. Bark D. Buds E. Fruit F. Leaf G. Seeds	I. Attentive to identifiable details of plants. II. Alert to unusual or odd plants. III. Enjoys the challenge of trying to identify unknown plants.

ANALYSIS

CURRICULUM: Horticulture Technology

SUBJECT AREA: Plant Identification and Cultural Requirements

TASK: (No. A3) Determine cultural requirements of plants (light, soil, moisture, temperature, etc.).

COMPETENCY: Identify the cultural requirements of selected plants.

CRITERION MEASURE: Cultural requirements of selected plants are correctly identified.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Identify cultural requirements.	I. Cultural requirements A. Water 1. Amount 2. Drainage 3. Quality B. Soil 1. Types a. Organic b. Mineral 2. Fertility 3. Acidity C. Light 1. Quality 2. Quantity D. Temperature 1. Range a. High-low b. Optimum	I. Recognizes the need for supplying plants with correct water, soil, light, and temperature requirements for optimum growth. II. Enjoys working with attractive, active growing plants.

OUTLINE OF INSTRUCTIONAL CONTENT (CONTINUED)

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
	2. Hardiness E. Air 1. Quality 2. CO_2 levels 3. Pollutants	

ANALYSIS

CURRICULUM: Horticulture Technology **SUBJECT AREA:** Preparing a Landscape

TASK: (No. B4) Determine the time of year to plant various species.

COMPETENCY: Select the optimum planting dates for various plant species.

CRITERION MEASURE: Optimum planting dates are correctly given for selected plants.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Quote optimum planting dates.	I. Determining factors A. Plant classification 1. Herbaceous 2. Woody a. Deciduous b. Evergreen B. Plant type 1. Ball and burlap 2. Bare-root 3. Containerized C. Soil conditions 1. Temperature 2. Moisture 3. Fertility 4. Cultivation 5. Drainage D. Light requirements 1. Photoperiodism	I. Realizes that plants grow best when planted during specified times.

OUTLINE OF INSTRUCTIONAL CONTENT (CONTINUED)

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
	2. Quantity	
	E. Water requirements	
	1. Rainfall	
	2. Irrigation	
	F. Temperature	
	1. Hardiness zone	
	2. Variation	
	G. Harvest date	
	1. Labor requirements	
	2. Growing schedules	

ANALYSIS

CURRICULUM: Horticulture Technology

SUBJECT AREA: Preparing a Landscape

TASK: (No. B5) Select proper planting site for different types of plants.

COMPETENCY: Select the proper planting sites for various plant species.

CRITERION MEASURE: Planting sites for selected plants are chosen correctly according to topography, soil conditions, climatic conditions, water requirements, plant use, artifacts, and existing vegetation.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Observe possible planting sites. II. Select planting sites.	I. Determining factors A. Topography B. Soil 1. Classification 2. Fertility 3. Depths 4. Drainage 5. Acidity C. Climate 1. Temperature 2. Moisture 3. Wind 4. Amount of sun/shade D. Water 1. Requirements 2. Supply E. Plant use (in landscape) F. Artifacts (buildings, roads) G. Existing vegetation	I. Appreciates the aesthetic value obtained from proper plant placement.

ANALYSIS

CURRICULUM: Horticulture Technology

SUBJECT AREA: Preparing a Landscape

TASK: (No. B6) Lay out space requirements.

COMPETENCY: Lay out space requirements for selected plants.

CRITERION MEASURE: Space requirements are laid out correctly for selected plants according to plant uses, plant characteristics, artifacts, and existing vegetation.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Measure area.	I. Measuring area A. Length, width B. Space between plants	I. Creates favorable home or business/industry environments.
II. Determine distances needed between plants and borders.	II. Determining factors in locating plants A. Plant uses 1. Shade 2. Enframement 3. Background 4. Boundary 5. Accent 6. Specimen 7. Foundation 8. Espalier 9. Ground cover 10. Screen	II. Recognizes the need for properly spacing plants.
III. Mark exact locations for planting.		III. Enjoys creating an attractive landscape.

OUTLINE OF INSTRUCTIONAL CONTENT (CONTINUED)

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
	B. Plant characteristics 1. Height at maturity 2. Spread at maturity 3. Rate of growth C. Existing vegetation	

ANALYSIS

CURRICULUM: Horticulture Technology

SUBJECT AREA: Preparing a Landscape

TASK: (No. B7) Clear brush and unwanted plants.

COMPETENCY:
1. Clear brush away from area without damaging vegetation.
2. Identify and remove unwanted plants.

CRITERION MEASURE:
1. Brush is removed from the area by hand or with motorized equipment without damaging existing vegetation.
2. Unwanted plants are identified according to the factors of land use, plant use, plant conditions, and plant characteristics.
3. Unwanted plants are removed by hand or with motorized equipment without damaging other vegetation.
4. All equipment is operated safely and correctly.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Remove brush by hand and equipment.	I. Removing brush A. Tools 1. Axes 2. Hand saws 3. Chain saws B. Equipment 1. Bulldozer or tractor with front-end loader 2. Trucks	I. Displays safety consciousness when working with tools and operating equipment
II. Identify unwanted plants.	II. Identification of unwanted plants A. Landscape design 1. Land use 2. Plant use B. Plant condition 1. Insect infestation 2. Disease	II. Works carefully to avoid damaging plants that are to be saved.
III. Remove unwanted plants by sawing, digging, or by using motorized equipment.		

OUTLINE OF INSTRUCTIONAL CONTENT (CONTINUED)

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
	3. Mechanical damage C. Plant characteristics 1. Herbaceous 2. Woody a. Deciduous b. Evergreen 3. Identification a. Flower b. Stem c. Bark d. Buds e. Fruit f. Leaf III. Removing plants A. Tools 1. Mattocks 2. Axes 3. Hand saws 4. Chain saws 5. Spades, shovels B. Equipment 1. Tractors 2. Trucks 3. Bulldozers C. Safety factors	

ANALYSIS

CURRICULUM: Horticulture Technology

SUBJECT AREA: Preparing a Landscape

TASK: (No. B8) Fell and remove trees

COMPETENCY: Fell and remove trees safely without damaging other vegetation.

CRITERION MEASURE:

1. Trees are marked and then cut using hand and power tools safely and efficiently.
2. Direction of tree fall is controlled in order to damage other trees and vegetation as little as possible.
3. Trees are removed using hand and power tools and equipment safely and efficiently and without damaging other vegetation.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Mark trees.	I. Marking trees A. Factors in determining trees to cut 1. Species 2. Size 3. Spacing in relation to other trees, vegetation and landscape design plan 4. Condition of trees B. Yellow paint sprayed on trees to be cut	I. Appreciates an attractive area.
II. Determine direction of fall.	II. Factors in determining direction of fall A. Growth habit of tree 1. Natural lean 2. Branching distribution	II. Displays safety consciousness when working with tools and operating equipment.
III. Cut out notch on one side of tree and finish cutting tree sawing from opposite side.		III. Enjoys physical work.
IV. Trim up tree.		
V. Remove wood and brush from the area.		

OUTLINE OF INSTRUCTIONAL CONTENT (CONTINUED)

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
	B. Location of other trees, buildings, vegetation, etc. C. Condition of trees 1. Insects 2. Diseases 3. Other damage III. Tools and equipment A. Axes B. Chain saws C. Tractors D. Trucks IV. Safety in performance A. Examine equipment B. Wood types 1. Softwood 2. Strong-flexible C. Avoid power lines D. Common sense	

ANALYSIS

CURRICULUM: Horticulture Technology

SUBJECT AREA: Preparing a Landscape

TASK: (No. B9) Take soil sample and interpret results.

COMPETENCY: Take soil samples according to established procedures, fill out information sheet, submit samples to a soil testing laboratory, and interpret the returned results.

CRITERION MEASURE:
1. Soil samples are taken according to established and approved procedures.
2. Information sheets are completed giving information on land use and fertilization and liming records.
3. Soil samples and information sheets are mailed to state or private soil testing laboratories.
4. Soil test results are interpreted and fertilization and liming amounts are determined.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Take a soil sample. A. Obtain soil from various locations in a field and put in bucket. B. Mix the soil thoroughly. C. Pour the mixed soil into the sample box. II. Fill out the information sheet. III. Label and date sample. IV. Submit information sheet and soil sample to appropriate soil testing laboratory.	I. Soil sampling A. Tools 1. Soil tube 2. Soil auger 3. Trowel 4. Shovel 5. Bucket B. Sampling techniques 1. Representative areas of field 2. Dry soil free of lumps and rocks II. Completing information sheet A. Problem areas B. Land use 1. Past 2. Present	I. Complies with recommended practices in taking soil tests in order to receive accurate results.

OUTLINE OF INSTRUCTIONAL CONTENT (CONTINUED)

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
	3. Future C. Cultivation practices D. Fertilization and liming record III. Interpreting test results A. Nutrient symbols B. Sources of recommended nutrients C. Determining amounts of fertilizer and lime to apply per acre based on recommendations D. pH	

ANALYSIS

CURRICULUM: Horticulture Technology SUBJECT AREA: Preparing a Landscape

TASK: (No. B10) Plow, disk, rake, till, or otherwise prepare land.

COMPETENCY: Prepare a good seedbed by plowing, disking, tilling, raking, etc.

CRITERION MEASURE:

1. Appropriate tools and equipment are selected.
2. The prepared seedbed is even and finely textured to a depth of 3-4 inches.
3. The equipment used in seedbed preparation is set up and adjusted correctly to provide maximum efficiency.
4. Tractor operation is efficient and handling procedures listed in the operator's manual are followed.
5. All safety precautions are observed.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Select appropriate tools and equipment. II. Set up and adjust equipment. III. Plow, disk, rake, till, or otherwise prepare seedbed.	I. Seedbed preparation A. Tools and equipment 1. Tractor 2. Plow 3. Disk 4. Tiller 5. Packer 6. Rakes 7. Hoes 8. Shovels 9. Rock and debris remover 10. Trailer or wagon 11. Wheelbarrow B. Set up and adjust equipment according to operator's manuals	I. Realizes that a good seedbed is required for maximum seed germination. II. Displays safety consciousness. III. Asks questions about setting up, adjusting, and operating equipment.

OUTLINE OF INSTRUCTIONAL CONTENT (CONTINUED)

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
	C. Operator tractor and equipment according to operator's manuals D. Safety precautions	

ANALYSIS

CURRICULUM: Horticulture Technology

SUBJECT AREA: Preparing a Landscape

TASK: (No. B11) Prepare flower and shrub beds for planting.

COMPETENCY: Prepare flower and shrub beds using tillers, rakes, hoes, etc.

CRITERION MEASURE:
1. Flower and shrub beds are even, finely textured to a depth of 3-4 inches and raked to remove rocks and other debris.
2. Tile is installed for proper drainage if needed.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Till beds to tear up and mix the soil. II. Dig ditches and install drainage tile (if needed). III. Level beds. IV. Rake beds to remove rocks and other debris.	I. Bed preparation A. Tools and equipment 1. Tiller 2. Hoes 3. Rakes 4. Shovels 5. Picks 6. Mattocks 7. Wheelbarrows 8. Levels 9. Tile hammers B. Use tools and operate equipment according to instructions found in operator's manuals. C. Factors to consider in determining if drainage tile is needed.	I. Realizes that good seedbed preparation is essential for good plant growth.

OUTLINE OF INSTRUCTIONAL CONTENT (CONTINUED)

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
	1. Type of soil 2. Lay of the land 3. Plants used in bed 4. Existing vegetation D. Installing tile (if needed) 1. Type and size of pipe 2. Size of crushed rock 3. Design layout 4. Slope required E. Soil additives (peat, sand, etc.).	

ANALYSIS

CURRICULUM: Horticulture Technology

SUBJECT AREA: Preparing a Landscape

TASK: (No. B12) Fumigate plant beds.

COMPETENCY: Fumigate plant beds safely using correct chemicals, materials, and procedures.

CRITERION MEASURE:

1. A recommended fumigant is chosen.
2. An effective fumigation method is selected and recommended procedures followed.
3. Equipment is correctly calibrated.
4. Plant beds are safely and properly fumigated.
5. All safety precautions are observed.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Select fumigant. II. Select fumigation method. III. Calibrate equipment. IV. Fumigate beds. A. Read and follow all directions on labels. B. Use safety practices.	I. Factors in selecting and applying fumigants A. Temperature B. Moisture C. Soil 1. Type 2. Condition 3. Aeration D. Timing E. Wind II. Methods of fumigation A. Hydraulic spraying B. Fumigators C. Dusters D. Soil drenches	I. Displays safety consciousness. II. Voluntarily learns as much as possible about types of chemicals and their uses. III. Attentive to following all procedures as recommended.

OUTLINE OF INSTRUCTIONAL CONTENT (CONTINUED)

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
	III. Chemicals A. Types B. Label information C. Instructions for application IV. Equipment A. Types B. Calibration V. Safety	

ANALYSIS

CURRICULUM: Horticulture Technology

SUBJECT AREA: Preparing a Landscape

TASK: (No. B13) Apply proper amounts of lime and fertilizer based on soil test results.

COMPETENCY: Apply recommended amounts of lime and fertilizer per acre based on soil test results using calibrated equipment.

CRITERION MEASURE:

1. Lime and fertilizer amounts per acre are determined according to soil test results.
2. Equipment is properly calibrated for application of determined rates.
3. Equipment is operated according to instructions found in the operator's manual.
4. All safety precautions are observed.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Compute lime and fertilizer amounts per acre.	I. Soil test results A. N, P, K levels B. Fertilizer formulations 1. Dry 2. Liquid C. Liming 1. Amount 2. Timing 3. pH	I. Realizes that better yields and increased profits result from proper amounts of lime and fertilizer.
II. Calibrate equipment. A. Measure specified length of space. B. Set equipment, apply material and catch it in containers. C. Weigh materials. D. Calculate rate of application and amount that would be applied per acre.	II. Equipment A. Tractor drawn spreaders B. Bulk trucks C. Hand held cyclone spreaders D. 100 foot tape measure E. Scales	II. Follows safety precautions in handling and applying lime and fertilizer.
III. Apply lime and fertilizer.		III. Practices calibration of equipment until it can be done efficiently and rapidly.

OUTLINE OF INSTRUCTIONAL CONTENT (CONTINUED)

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
IV. Practices safety principles. A. Read labels. B. Follow label directions. C. Post warning signs. D. Use proper equipment. E. Wear protective clothing.	III. Application of fertilizer and lime A. Equipment calibrated correctly 1. Dry materials a. Pounds/acre b. Placement 2. Liquid materials a. Gallon/acre b. ppm c. Travel rate d. Pump pressure B. Equipment operated efficiently and correctly according to operator's manual. IV. Math A. Algebraic formulas B. Percentages C. Ratios V. Safety A. Reading B. Comprehension	

ANALYSIS

CURRICULUM: Horticulture Technology

SUBJECT AREA: Preparing a Landscape

TASK: (No. B14) Dig drainage ditches and install drain tile.

COMPETENCY: Dig drainage ditches and install drain tile using prepared blueprints.

CRITERION MEASURE:

1. Drainage ditches are dug to the proper depth, width, and slope.
2. Hand and motorized equipment is used efficiently and operated according to recommendations found in owner's manual.
3. Tile is selected that will do the best job for the situation.
4. Drain tile is installed using recommended procedures.
5. The tile line has the proper slope or grade.
6. All safety precautions are observed.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Read and interpret blueprints.	I. Blueprints A. Scale B. Dimensional lines C. Specifications	I. Realizes that installing drain tile according to blueprint specifications is important to assure adequate drainage.
II. Dig drainage ditches. A. Operate equipment. B. Dig to proper width, depth, and slope.	II. Methods of digging ditches A. Mechanical digger (long ditches B. Backhoe (home sites) C. Hand digging (small lines)	II. Displays safety consciousness in operating equipment.
III. Install drain tile. A. Put rock or gravel in bottom of ditch. B. Lay tile. C. Cover tile with additional rock or gravel. D. Backfill ditch.	III. Drain tile A. Type and size gravel or rock B. Depth of gravel bed C. Slope or grade D. Type and size of pipe E. Depth to cover tile with rock or gravel	III. Attentive to following blueprint specifications.

Outline of Instructional Content (Continued)

Skill/Process	Knowledge/Theory	Value/Attitude Concepts
	F. Backfilling 1. Backhoe and blade 2. Hand covering	

ANALYSIS

CURRICULUM: Horticulture Technology

SUBJECT AREA: Preparing a Landscape

TASK: (No.B15) Install irrigation system if needed.

COMPETENCY:
1. Install an irrigation system to fit the requirements of the nursery.
2. Read and interpret blueprints.

CRITERION MEASURE:
1. An irrigation method is chosen that fits the needs of the nursery or the situation.
2. An adequate water source is used.
3. For a sprinkler system, proper size pipe is selected to adequately feed water to all designated areas.
4. For a sprinkler system, pipes are properly installed, and risers are located to allow for small overlaps of water.

OUTLINE OF INSTRUCTIONAL CONTENT (SEE ATTACHMENT FOR CONCLUSION OF CRITERION MEASURE)

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Read and interpret blueprints.	I. Blueprints A. Scale B. Dimensional lines C. Specifications	I. Recognizes the need to be very selective in choosing an irrigation system.
II. Install an irrigation system. A. Select the method depending upon the situation. B. Dig ditches or install pipes, depending on the method chosen. C. Select and install pump or pumps.	II. Irrigation methods A. Surface 1. Flood 2. Furrows B. Sprinkler C. Subsurface	II. Attentive to specifications when installing the system, including pumps.
	III. Characteristics of each irrigation method	III. Realizes that without an adequate water source, the system is almost useless.
	IV. Advantages and disadvantages of each irrigation method	

Outline of Instructional Content (Continued)

Skill/Process	Knowledge/Theory	Value/Attitude Concepts
	V. Determining factors A. Topography B. Area size C. Cost D. Labor E. Water supply F. Plants' water requirements	

ATTACHMENT TO TASK #B15

CRITERION MEASURE:

5. An adequate size pump or pumps are selected.
6. Pumps are installed according to manufacturer's recommendations.
7. The system or method chosen is operated according to recommendations.

ANALYSIS

CURRICULUM: Horticulture Technology

SUBJECT AREA: Preparing a Landscape

TASK: (No. B16) Dig holes for plant setting.

COMPETENCY: Dig holes mechanically or by hand for various plant species.

CRITERION MEASURE:

1. Holes are dug with the correct depth and diameter for selected plants.
2. The equipment used to dig holes mechanically is operated according to manufacturer's recommendations.
3. Post hole diggers, picks, shovels, and mattocks are used efficiently.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Dig holes for plant setting.	I. Plant types A. Bare-root B. B & B C. Container	I. Realizes that large holes are necessary for plants to get a good start and grow well.
	II. Equipment A. Power, PTO operated B. Hand 1. Post hole diggers 2. Picks 3. Shovels 4. Mattocks	II. Displays safety consciousness when using power equipment and hand tools.
	III. Hole size A. Depth B. Diameter	

ANALYSIS

CURRICULUM: Horticulture Technology

SUBJECT AREA: Preparing a Landscape

TASK: (No. B17) Apply preemergence chemicals for weed control.

COMPETENCY: Apply preemergence chemicals for weed control on various plant species using calibrated equipment.

CRITERION MEASURE:

1. Recommended preemergence chemicals are chosen for weed control for various weeds on selected plants.
2. Correct method of application is chosen depending on the situation.
3. Equipment is properly calibrated.
4. Herbicides are applied at the correct time and at the recommended rate, without damaging other vegetation.
5. Equipment is operated according to manufacturer's recommendations.
6. All safety precautions are observed.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Select chemical. II. Select application method. III. Calibrate equipment. IV. Apply preemergence herbicides. A. Read and follow all directions on labels. B. Follow safety practices.	I. Factors in selecting herbicides A. Type weeds B. Cost C. Type of equipment on hand D. Characteristics of area to be sprayed E. Location of area to be sprayed II. Factors in applying herbicides A. Coverage of area B. Surface retension C. Timing D. Moisture E. Temperature F. Soil 1. Type	I. Displays safety consciousness in operating equipment and applying chemicals. II. Attentive to following directions on labels. III. Realizes that chemicals can be harmful and therefore handles and uses all chemicals carefully.

OUTLINE OF INSTRUCTIONAL CONTENT (CONTINUED)

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
	2. Condition 3. Aeration G. Wind III. Methods of application A. Hand or back sprayers B. PTO operated C. Tractor-pulled units IV. Safety precautions	

ANALYSIS

CURRICULUM: Horticulture Technology

SUBJECT AREA: Preparing a Landscape

TASK: (No. B18) Mix the soil and soil conditioners.

COMPETENCY: Mix soil and soil conditioners by hand or mechanically.

CRITERION MEASURE:

1. Soil and soil conditioners are uniformly mixed.
2. Mechanical equipment is operated according to manufacturer's recommendations.
3. Shovels, rakes, and hoes are used efficiently.
4. Soil mixture is free of lumps, individual ingredients, or foreign material.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Mix soil and soil conditioners.	I. Soil conditioners A. Inorganic 1. Sand 2. Perlite 3. Vermiculite 4. Other B. Organic 1. Humus 2. Manure 3. Peat 4. Bark 5. Hulls II. Mixing techniques (use and/or operation of tools and equipment) A. Hand 1. Shovels	I. Realizes that soils and soil conditioners must be mixed well and free of lumps for proper plant growth.

OUTLINE OF INSTRUCTIONAL CONTENT (CONTINUED)

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
	2. Rakes 3. Hoes B. Mechanical 1. Concrete mixers 2. Rotary tiller 3. Bobcat loader 4. Tractor-mounted loader	

ANALYSIS

CURRICULUM: Horticulture Technology

SUBJECT AREA: Preparing a Landscape

TASK: (No. B19) Relocate plants, if needed.

COMPETENCY: Dig established plants by hand or mechanically and replant them in a designated area.

CRITERION MEASURE:

1. Established plants are dug without damaging the roots, bark, stems, branches, or foliage.
2. Recommended procedures are followed when digging plants.
3. Equipment used in digging plants is operated according to manufacturer's recommendations, and all recommended procedures are followed.
4. Shovels, mattocks, and other hand equipment is properly used.
5. Plantbeds and holes are prepared according to recommended practices.
6. Plants are placed in holes and beds according to recommended practices.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Dig plants by hand or mechanically. II. Prepare plant beds or holes in which to place plants. III. Plant the dug plants.	I. Relocating plants A. Reasons 1. Environment a. Drainage b. Wind c. Sun 2. Construction 3. Landscape design plans 4. Growth of plant B. Digging plants 1. Hand a. B & B b. Bare-root 2. Mechanically a. PTO driven, tractor mounted	I. Follows recommended procedures in relocating plants. II. Accepts responsibility for damaged plants. III. Carefully handles plants to insure as high a rate of liveability as possible.

Outline of Instructional Content (Continued)

Skill/Process	Knowledge/Theory	Value/Attitude Concepts
	b. Self-contained units c. Operating procedures C. Preparing plant beds D. Preparing holes for planting E. Planting procedures	

ANALYSIS

CURRICULUM: Horticulture Technology

SUBJECT AREA: Planting a Landscape

TASK: (No. C20) Seed a lawn.

COMPETENCY: Select seed and seed a prepared area by hand and by using mechanical seeders.

CRITERION MEASURE:

1. Appropriate type of grass seed is selected for a designated location.
2. Seeds are sown evenly and at recommended rates.
3. Mechanical seeders are operated according to manufacturer's recommendations.
4. Seeders are calibrated accurately.
5. An appropriate mulch is used and spread evenly over the area.
6. The soil is watered adequately.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Select seed.	I. Types of grasses A. Warm season 1. Bermuda grass 2. Centipede grass 3. Carpet grass B. Cool season 1. Tall fescue 2. Red fescue 3. Rye grass 4. Bluegrass C. Grass characteristics 1. Spreading 2. Growing in clumps D. Conditions of growth 1. Sunny or shady locations 2. Type of soil 3. Amount of water 4. pH	I. Recognizes the need to select the type grass that will grow best in the various regions of the state. II. Shows patience in sowing seed in order to get an even distribution.

OUTLINE OF INSTRUCTIONAL CONTENT (CONTINUED)

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
II. Sow seeds. A. Cover B. Roll C. Mulch D. Water	II. Seeding of lawn A. Broadcast seeds 1. Methods a. Hand b. Mechanical 2. Rates 3. Calibration of equipment B. Factors 1. Time of year (temperature) 2. Wind 3. Moisture	

ANALYSIS

CURRICULUM: Horticulture Technology

SUBJECT AREA: Planting a Landscape

TASK: (No. C21) Place sod.

COMPETENCY: Select type of grass for sodding and lay sod in a designated area that has been prepared.

CRITERION MEASURE:

1. Appropriate type of grass is selected for sodding a designated location.
2. Sod is laid evenly and level, with sides and ends fitting close together.
3. Sod is cut where necessary to fit closely to walks, borders, and other objects.
4. Sod is pounded down to adhere to ground.
5. Sod is watered thoroughly.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Select sod.	I. Type of sod A. Warm season 1. Bermuda 2. Centipede 3. Carpet B. Cool season 1. Tall fescue 2. Red fescue 3. Rye grass 4. Bluegrass C. Factors in selection 1. Active growth 2. No disease or insects 3. No foreign matter (weeds, other grasses, etc.)	I. Carefully selects sod that is healthy and free of insects, disease, foreign matter, etc. II. Enjoys an attractive, well laid sod.

OUTLINE OF INSTRUCTIONAL CONTENT (CONTINUED)

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
II. Lay sod. A. Fit pieces together. B. Cut when necessary to lay close to walks, borders, buildings, etc. C. Level. D. Pound down. E. Water.	II. Procedures for laying sod	

ANALYSIS

CURRICULUM: Horticulture Technology

SUBJECT AREA: Planting a Landscape

TASK: (No. C22) Sprig a lawn.

COMPETENCY: Select type of grass for sprigging and sprig a prepared area using recommended procedures.

CRITERION MEASURE:
1. Appropriate type of grass is selected for sprigging a designated location.
2. Sprigs are planted at the proper depth and spacing.
3. Soil is packed around the sprigs and sprigs are watered thoroughly.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Select sprigs.	I. Types of grasses A. Warm season 1. Bermuda 2. Zoysia 3. Centipede 4. St. Augustine B. Factors in selection 1. Free of insects and diseases 2. Free of weeds, other grasses and other foreign matter 3. Healthy, active growing sprigs	I. Carefully selects sprigs that are healthy, free of insects, diseases, other grasses, and other foreign matter. II. Follows recommended practices in sprigging the prepared area.
II. Plant sprigs.	II. Sprigging procedures	

OUTLINE OF INSTRUCTIONAL CONTENT (CONTINUED)

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
A. Space sprigs according to recommendations and at proper depth. B. Water thoroughly.		

ANALYSIS

CURRICULUM: Horticulture Technology

SUBJECT AREA: Planting a Landscape

TASK: (No. C23) Place plants in beds, trenches, and holes.

COMPETENCY: Place and plant plants in prepared beds, trenches, and holes.

CRITERION MEASURE:

1. Plants are placed straight and at the correct depth.
2. Plants are planted in best area for type of plant (beds, trenches, or holes).
3. Plants are spaced so as not to crowd each other and are attractive.
4. Holes are backfilled carefully so as not to damage roots, stems, bark, or foliage.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Locate plants in beds, trenches, or holes.	I. Factors in plant location and type area in which to plant A. Plant type and variety B. Growth habits 1. Low growing or tall 2. Wide or narrow span 3. Shallow, medium, or deep rooted C. B & B, Bare-root, or container	I. Realizes that plants grow best when not crowded and placed in well prepared area at correct depth. II. Handles and transplants plants carefully in order not to damage them.
II. Plant plants. A. B & B 1. Remove burlap. 2. Place plant in prepared area erect and at correct depth.	II. Planting procedures	

OUTLINE OF INSTRUCTIONAL CONTENT (CONTINUED)

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
B. Bare-root 1. Spread roots out. 2. Place plant in prepared area, with roots evenly spread out. 3. Place plant erect and at proper depth. C. Container-grown plants 1. Remove container. 2. Place plant in prepared area erect and at proper depth.		

ANALYSIS

CURRICULUM: Horticulture Technology

SUBJECT AREA: Planting a Landscape

TASK: (No. C24) Backfill the hole with soil mix.

COMPETENCY: Backfill the hole with soil mix.

CRITERION MEASURE:
1. Soil mix is packed firmly under and around the plant.
2. The mix is placed carefully around the plant to prevent injury.
3. A mound is constructed around the plant for adequate watering.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Backfill hole. A. Move soil mix carefully over and around roots or ball of plants. B. Pack soil mix firmly around and over roots. C. Water thoroughly before completing backfilling in order to remove air spaces around roots. D. Construct mound of soil around base of plant.	I. Soil mix A. Soil B. Peat moss C. Vermiculite D. Perlite E. Sawdust F. Etc.	I. Carefully backfills holes in order not to damage plants.
	II. Soil amendments A. Characteristics 1. Supportive 2. Moisture retentive 3. Porous B. Advantages C. Disadvantages	
	III. Procedures for backfilling holes	

Appendix G

ANALYSIS

CURRICULUM: Horticulture Technology

SUBJECT AREA: Planting a Landscape

TASK: (No. C25) Properly water the lawn, flowers, shrubs, and trees.

COMPETENCY: Water the lawn, flowers, shrubs, and trees for adequate soil moisture.

CRITERION MEASURE:

1. Lawn and plants are watered only when they need to be watered.
2. No damage or injury is done to the lawn or plants.
3. The correct type of equipment is selected depending on what is to be watered.
4. No more water is applied at any one time than is needed to do an adequate job.
5. Water is evenly distributed to the area.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Determine when to water plants.	I. Factors to consider in watering plants A. Moisture of soil B. Water requirements for different plants C. Time to water 1. Wind 2. Temperature 3. Rain D. Soil drainage	I. Tries to save as much water as possible by watering only when necessary and not overwatering.
II. Water plants.	II. Types of equipment A. Hoses B. Soakers C. Nozzles D. Handwand	II. Sensitive to different water requirements of plants.
III. Measure amount of water used by placing containers in several different places in area of water distribution.		

Outline of Instructional Content (Continued)

Skill/Process	Knowledge/Theory	Value/Attitude Concepts
	III. Watering plants A. Placement of hoses and soakers B. Even distribution of water C. Measuring amount applied	

ANALYSIS

CURRICULUM: Horticulture Technology

SUBJECT AREA: Planting a Landscape

TASK: (No. C26) Mulch plantings with proper materials.

COMPETENCY: Mulch plantings with proper materials.

CRITERION MEASURE:
1. Appropriate mulches are selected for designated plantings.
2. Designated areas are mulched at the appropriate time and to the proper depth.
3. Mulches are applied carefully in order not to damage plants.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Select mulch. II. Place mulch under and around plants.	I. Types of mulch and characteristics of each A. Bark B. Leaves C. Rocks D. Sphagnum peat moss E. Straw F. Black polyethylene G. Other II. Benefits A. Weed control B. Moisture conservation C. Insulation D. Soil conservation E. Attractive landscape	I. Realizes the benefits of using mulch around plants. II. Works carefully not to damage plants when applying mulch.

OUTLINE OF INSTRUCTIONAL CONTENT (CONTINUED)

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
	III. Application A. Time B. Depth C. Fertilization D. Plant type IV. Procedures in applying mulch	

ANALYSIS

CURRICULUM: Horticulture Technology

SUBJECT AREA: Planting a Landscape

TASK: (No. C27) Untie and groom plants.

COMPETENCY: Untie and groom plants.

CRITERION MEASURE:

1. Plants are untied carefully in order not to damage or injure them.
2. The best method of grooming plants is selected.
3. Grooming is done properly and without injuring the plants.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Untie plants by removing wires, labels, and cords.	I. Untying procedures	I. Works carefully not to damage plants.
II. Groom plants. A. Reshape by pruning. B. Wrap trunk.	II. Grooming A. Pruning 1. Removing damaged stems 2. Reshaping 3. Methods B. Wrapping 1. Reasons for a. Water loss b. Sun scald c. Insects d. Fungal infections 2. Materials a. Burlap strips b. Tree wrapping c. Twine 3. Methods	II. Exhibits patience in wrapping plants in order to do a good job.

ANALYSIS

CURRICULUM: Horticulture Technology

SUBJECT AREA: Planting a Landscape

TASK: (No. C28) Support plants by guying, staking, or cabling.

COMPETENCY: Support plants by guying, staking, or cabling.

CRITERION MEASURE:

1. Correct type, number, and amount of materials are selected depending upon size and type of plants.
2. Stakes are placed around the plant and driven into the ground with approximately 1/3 of the stakes showing above ground.
3. Wire is placed around the plant with hose used for protection.
4. Turn buckles are installed and an even amount of tension is applied to each wire.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Select material needed.	I. Reasons for guying and staking A. Protection B. Anchorage C. Support	I. Works carefully in order not to damage plants.
II. Drive stakes into ground.	II. Materials A. Wire B. Hose C. Turn buckles D. Stakes E. Lag hooks	II. Selects materials that are adequate for the job.
III. Attach wire and hose around the tree and then attach wire to stakes.	III. Factors A. Size of plant B. Number of stakes C. Placement of stakes D. Wire size	
IV. Install turn buckles and adjust the tension.	IV. Guying and staking procedures	

ANALYSIS

CURRICULUM: Horticulture Technology **SUBJECT AREA:** Planting a Landscape

TASK: (No. C29) Clean up and make final inspection of landscape job.

COMPETENCY: Clean up and make final inspection of landscape job.

CRITERION MEASURE:

1. All debris is removed from the job and properly disposed.
2. The area is raked or otherwise groomed and left neat and attractive.
3. All damaged plants, walkways, etc. are repaired or replaced.
4. The area is inspected one last time to see that all special requests and other details of the landscape plan have been met and that the area is free of debris and is attractive.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Clean up landscape job. A. Pick up and remove all debris from area. B. Sweep walks, drives, etc. C. Repair or replace all damaged areas and/or plants.	I. Clean-up procedures	I. Carefully evaluates the job to be sure it meets all specifications of the plan.
II. Inspect landscape job.	II. Inspection procedures A. Landscape plan B. Planting details C. Special requests	II. Attentive to details and makes sure that the area is neat and attractive.
		III. Commends workers who have done a good job.
		IV. Recognizes that customers appreciate a neat, attractive job.

ANALYSIS

CURRICULUM: Horticulture Technology

SUBJECT AREA: Landscape Maintenance

TASK: (No. D30) Clean grounds of leaves and litter.

COMPETENCY: Remove leaves and litter from lawns and shrubbery by hand and by using equipment.

CRITERION MEASURE:

1. Lawns and shrubbery are free of leaves and litter.
2. Leaves and litter are removed without damaging grass or shrubbery.
3. Equipment is operated efficiently and safely according to operator's manual.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Remove leaves and litter. A. Rake B. Blow C. Vacuum	I. Reasons for removal A. Root suffocation B. Insect infestation C. Disease infestation D. Eye appeal	I. Enjoys a neat and attractive lawn and clean shrubs.
II. Operate equipment.	II. Types of equipment (adjustment and operation) A. Vacuum 1. Mower and vacuum 2. Self-contained units B. Blowers C. Hand tools 1. Yard rakes 2. Leaf rakes	II. Realizes that leaves and litter may harm a lawn and shrubbery if not removed.

ANALYSIS

CURRICULUM: Horticulture Technology

SUBJECT AREA: Landscape Maintenance

TASK: (No. D31) Identify weeds, pests, and diseases.

COMPETENCY: Correctly identify weeds, diseases, insects, and damage by other pests visually and by using resource materials, and spell the common names of weeds, diseases, and insects.

CRITERION MEASURE:

1. Selected weeds are identified by common names visually and by using resource materials.
2. Selected diseases are identified by common names visually and by using resource materials.
3. Selected insects are identified by common names visually and by using resource materials.
4. Damage caused by other pests (i.e. rabbits) are identified.
5. Common names of weeds, diseases, and insects are spelled correctly.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Identify weeds.	I. Weeds A. Identification characteristics of weeds 1. Flower 2. Leaves 3. Fruit 4. Growth habit	I. Alert to odd or unusual weeds, diseases, and insects. II. Enjoys the challenge of identifying weeds, diseases, and insects.
II. Identify diseases.	II. Diseases A. Types of pathogens 1. Bacteria 2. Fungi 3. Virus 4. Microplasms B. Type of damage (symptoms)	III. Attentive to identifiable details of weeds, diseases, and insects. IV. Realizes that weeds, insects, and diseases must be identified before control measures can be implemented.

OUTLINE OF INSTRUCTIONAL CONTENT (CONTINUED)

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
III. Identify insects.	III. Insects A. Classification 1. Beneficial 2. Destructive a. Type of insect 1. Sucking 2. Chewing 3. Rasping b. Type of damage 1. Internal 2. External B. Damage	
IV. Identify damage caused by other pests.	IV. Other damage from pests (i.e. rabbits, mice, nematodes, deer)	
V. Use resource materials.	V. Kinds of resource materials A. Keys B. Books C. Trade magazines D. Horticulture specialists E. Trade catalogs F. Scientific publications G. Research laboratories (samples)	
VI. Spell common names of weeds, diseases, and insects.	VI. Spelling techniques A. Memorization B. Association C. Spelling rules D. Latin usage	

ANALYSIS

CURRICULUM: Horticulture Technology

SUBJECT AREA: Landscape Maintenance

TASK: (No. D32) Determine methods of control needed to eradicate weeds, pests, and diseases.

COMPETENCY: List control methods for weeds, pests, and diseases from memory or by using reference material.

CRITERION MEASURE: Control methods for weeds, pests, and diseases are correctly provided by recall or by using reference material.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Identify control methods by recall.	I. Control methods for weeds A. Mechanical B. Chemical (list types) 1. Postemergence 2. Preemergence C. Hand removal	I. Realizes that control of weeds, pests, and diseases results in better plant growth and a more saleable plant.
II. Determine control methods by using resource materials.	II. Control methods for pests A. Mechanical B. Biological C. Cultural D. Chemical (types) 1. Contact 2. Systematic	
	III. Control methods for diseases A. Chemical B. Sanitation	

OUTLINE OF INSTRUCTIONAL CONTENT (CONTINUED)

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
	VI. Resource materials A. Plant keys B. Books C. Trade magazines D. People E. Trade catalogs F. Scientific publications	

ANALYSIS

CURRICULUM: Horticulture Technology

SUBJECT AREA: Landscape Maintenance

TASK: (No. D33) Apply appropriate control measures and calibrate proper equipment.

COMPETENCY: Apply control measures on weeds, pests, and diseases using chemicals and other measures where appropriate. Calibrate equipment.

CRITERION MEASURE:

1. Chemical control measures are applied correctly following label instructions.
2. Sprayers, dusters, and foggers are operated according to manufacturer's recommendations and calibrated correctly.
3. Biological, cultural, sanitation, and chemical control measures are used where appropriate, and recommended procedures
4. All safety precautions are observed.
5. Equipment is thoroughly cleaned after each use, removing all residues.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Read and follow labels for chemical control measures.	I. Chemical labels A. Directions B. Precautions C. Controls D. Effective dates of use E. Other information	I. Complies with warnings and other instructions on all labels.
II. Set up, adjust, and operate sprayers, dusters, and foggers.	II. Setting up, adjusting, calibrating, and operating equipment A. Sprayers B. Dusters C. Foggers	II. Displays safety consciousness in handling and using chemicals.
III. Calibrate equipment.	III. Control measures (follow recommended procedures) A. Biological B. Cultural	III. Only uses control measures when necessary.
IV. Implement biological, cultural, sanitation, and chemical control measures where applicable.		
V. Clean equipment after use. A. Wash equipment thoroughly with soap and water. B. Run water through nozzles. C. Dry excess water with clean cloth and allow to dry thoroughly.		

OUTLINE OF INSTRUCTIONAL CONTENT (CONTINUED)

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
	C. Chemical 1. Mechanical application 2. Hand application D. Sanitation	

ANALYSIS

CURRICULUM: Horticulture Technology

SUBJECT AREA: Landscape Maintenance

TASK: (No. D34) Follow all safety precautions when administering control measures.

COMPETENCY: Describe and follow the safety factors involved in using equipment and administering control measures on weeds, pests, and diseases.

CRITERION MEASURE:

1. Safety regulations and precautions described on labels are followed.
2. Safety factors in setting up, adjusting, and operating equipment are described and followed.
3. Recommended safety factors are followed when control measures are being implemented.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Read and follow safety regulations and precautions described on labels.	I. Labels A. Precautions B. Warnings C. Effective dates of use	I. Realizes that following safety precautions reduces the chance of injury to self and others.
II. Set up, adjust, and operate equipment in safe manner. A. Sprayers B. Dusters C. Foggers D. Traps	II. Recommended safety warnings and precautions are observed in setting up, adjusting, and operating equipment	II. Attentive to safety warnings and precautions on labels.
III. Administer controls measures safely. A. Wear protective clothing. B. Measure concentrates and powders carefully. C. Mix ingredients carefully without spilling.	III. Safety precautions and procedures when implementing control measures	III. Follows directions on labels explicitly on amounts of materials to use.
		IV. Avoids getting chemicals on self or others.

OUTLINE OF INSTRUCTIONAL CONTENT (CONTINUED)

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
D. Keep spray materials off skin. E. Avoid spraying on windy days.		

ANALYSIS

CURRICULUM: Horticulture Technology **SUBJECT AREA:** Landscape Maintenance

TASK: (No. D35) Have knowledge of factors affecting control measures (wind, rain, temperature, etc.).

COMPETENCY: Describe how wind, rain, temperature, humidity, and soil conditions affect control measures on weeds, pests, and diseases.

CRITERION MEASURE: Control measures affected by environmental factors are described correctly by recall.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Describe how various factors affect control measures. A. Wind B. Rain C. Temperature D. Humidity E. Soil moisture and temperature	I. Environmental conditions affecting control measures A. Drift of chemicals as affected by rain and wind B. Concentration of chemicals on leaves as affected by rain C. Absorption and effectiveness of chemicals as related to temperature D. Damage to leaf surface by chemicals related to high temperature and humidity E. Leaching and absorption of chemicals as related to soil moisture F. Effectiveness of chemicals	I. Adapts application and techniques to existing environmental conditions. II. Delays application of chemicals when environmental conditions are not suitable.

OUTLINE OF INSTRUCTIONAL CONTENT (CONTINUED)

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
	as related to soil temperature and moisture G. Evaporation of chemicals as affected by wind, temperature, humidity, etc.	

ANALYSIS

CURRICULUM: Horticulture Technology **SUBJECT AREA:** Landscape Maintenance

TASK: (No. D36) Clean drainage ditches, culverts, and gutters.

COMPETENCY: Remove leaves, trash, silt, and other materials from drainage ditches, culverts, and gutters by hand and mechanically.

CRITERION MEASURE:

1. Drainage ditches, culverts, and gutters are free of leaves, trash, silt, and other materials.
2. Tools and mechanical equipment are used and operated according to manufacturer's recommendations.
3. Drainage ditches, culverts, and gutters are not damaged from cleaning.
4. Original depths and slopes of drainage ditches are maintained.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Remove leaves, trash, silt, and other materials from gutters, drainage ditches, and culverts by hand and by using hand tools.	I. Tools and equipment (use and/or operate according to manufacturer's recommendations) A. Ladder B. Rake C. Shovel D. Wheelbarrow E. Backhoe F. Plow G. Disk H. Other	I. Realizes that the useful life of gutters and roofs are increased when gutters are kept clean.
II. Remove leaves, trash, silt, and other materials mechanically. A. Operate backhoe. B. Plow and/or disk drainage ditch.	II. Removal procedures	II. Realizes that overflows of drainage ditches and culverts are reduced and thus damage from flooding lessened when they are free of trash, leaves, silt, etc.

ANALYSIS

CURRICULUM: Horticulture Technology

SUBJECT AREA: Landscape Maintenance

TASK: (No. D37) Prune and remove dead or unwanted plant branches.

COMPETENCY: Use recommended procedures in pruning dead or unwanted plant branches and properly remove and dispose of branches.

CRITERION MEASURE:
1. Dead or unwanted plant branches are correctly pruned according to recommended procedures.
2. Plant debris is removed without damaging grass or other landscape materials.
3. Debris is disposed of without damage to the environment.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Prune dead or unwanted plant branches. II. Remove debris. A. Hand removal B. Cut into small pieces by chainsaw or handsaw III. Dispose of debris A. Burn B. Mechanical chipper C. Haul to landfill	I. Pruning equipment and characteristics A. Hand shears B. Lopers C. Saws D. Axes E. Knives II. Timing A. Herbaceous plants B. Woody plants 1. Deciduous 2. Evergreen C. Factors 1. Food supply 2. Flowering period 3. Plant hardiness 4. Plant dormancy	I. Appreciates active, healthy growing plants. II. Appreciates an attractive landscape, with no dead, broken or other unsightly branches.

OUTLINE OF INSTRUCTIONAL CONTENT (CONTINUED)

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
	5. Labor availability III. Methods of pruning (charac-teristics and methodology A. Thinning B. Heading back C. Selective removal IV. Objectives or reasons for pruning A. Preserve plant health B. Remove broken and dead limbs C. Emphasize growth habit D. Sculpture plants E. Reduce danger on large plants and trees F. Restrict plant growth	

ANALYSIS

CURRICULUM: Horticulture Technology

SUBJECT AREA: Landscape Maintenance

TASK: (No. D38) Scrape plant wounds.

COMPETENCY: Scrape and shape plant wounds using appropriate tools and recommended procedures.

CRITERION MEASURE:

1. Plant wounds are correctly scraped and shaped for proper healing using recommended procedures and appropriate tools.
2. Reasons for scraping and shaping plant wounds are listed.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Scrape and shape plant wounds.	I. Purposes A. Prevent decay B. Prevent premature death.	I. Values plants and enjoys healthy, actively growing plants.
	II. Timing factors	II. Practices scraping wounds in order to do it correctly and efficiently.
	III. Tools (charachertistics and proper use)	III. Alert to plant wounds in order for the plant to be repaired before permanent damage results.
	IV. Methodology	

ANALYSIS

CURRICULUM: Horticulture Technology **SUBJECT AREA:** Landscape Maintenance

TASK: (No. D39) Apply protective substance to tree wounds or cut surfaces.

COMPETENCY: Select and apply protective substance to tree wounds or cut surfaces.

CRITERION MEASURE:
1. Protective substances are selected that properly protect plants.
2. Reasons for applying protective substances are listed.
3. Protective substances are uniformly applied to tree wounds or cut surfaces.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Select protective substances.	I. Factors or reasons for applying protective substances to wounds A. Disinfect area B. Prevent entrance of fungi C. Stimulate callus formation D. Toxic to parasitic organisms	I. Displays confidence in applying protective substances to plant wounds.
II. Apply protective substances. A. Brush on wound. B. Spray. C. Use hand tool (trowel, putty knife, etc.	II. Types of substances and characteristics of each type A. Orange shellac B. Asphaltum paints C. Creasote paints D. Lanolin paints E. Grafting waxes F. Bordeaux paste G. Commercial tree paints 1. Aerosol 2. Brushed	II. Appreciates a properly healed plant.
	III. Application procedures	

ANALYSIS

CURRICULUM: Horticulture Technology

SUBJECT AREA: Landscape Maintenance

TASK: (No. D40) Prune and trim trees and shrubs at the correct time using proper equipment and methods.

COMPETENCY: Prune plants at proper time using appropriate methods and tools.

CRITERION MEASURE:

1. Correct times are identified for pruning various species of plants.
2. The proper pruning method is selected for the condition and type of plant.
3. Correct pruning procedures are followed for the selective and heading back pruning methods.
4. Reasons for pruning are correctly identified.
5. Appropriate tools are selected for the type of pruning to be done.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Select equipment. II. Prune plants following recommended procedures.	I. Pruning equipment (characteristics and uses) A. Hand shears B. Loppers C. Saws D. Axes E. Knives II. Timing A. Herbaceous plants B. Woody plants 1. Deciduous 2. Evergreen C. Factors 1. Food supply 2. Flowering period 3. Plant hardiness	I. Realizes that customers value well-pruned, healthy plants. II. Follows recommended pruning procedures. III. Voluntarily practices pruning procedures.

OUTLINE OF INSTRUCTIONAL CONTENT (CONTINUED)

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
	4. Plant dormancy 5. Labor availability III. Methods of pruning (characteristics and methodology) IV. Objectives or reasons for pruning A. Preserve plant health B. Remove broken and dead limbs C. Emphasize growth habit D. Sculpture plants E. Reduce danger on large plants and trees F. Restrict plant growth G. Encourage flowering H. Repair damaged or diseased plants	

ANALYSIS

CURRICULUM: Horticulture Technology

SUBJECT AREA: Landscape Maintenance

TASK: (No. D41) Prepare lawn for reseeding.

COMPETENCY: Prepare a good seedbed by plowing, disking, tilling, raking, etc.

CRITERION MEASURE:

1. Appropriate tools and equipment are selected.
2. The prepared seedbed is even and finely textured to a depth of 3-4 inches.
3. The equipment used in seedbed preparation is set up and adjusted correctly to provide maximum efficiency.
4. Tractor operation is sufficient and handling procedures listed in the operator's manual are followed.
5. All safety precautions are observed.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Select appropriate tools and equipment. II. Set up and adjust equipment. III. Plow, disk, rake, till, or otherwise prepare seedbed.	I. Seedbed preparation A. Tools and equipment 1. Tractor 2. Plow 3. Disk 4. Tiller 5. Packer 6. Rakes 7. Hoes 8. Shovels 9. Rock and debris remover 10. Trailer or wagon 11. Wheelbarrow B. Set up and adjust equipment according to operator's manuals C. Operate tractor and equipment according to operator's manuals D. Know safety precautions	I. Realizes that a good seedbed is required for maximum seed germination. II. Displays safety consciousness. III. Asks questions about setting up, adjusting, and operating equipment.

ANALYSIS

CURRICULUM: Horticulture Technology **SUBJECT AREA:** Landscape Maintenance

TASK: (No. D42) Reseed, sod, or sprig a lawn.

COMPETENCY: Reseed, resod, and resprig a lawn by adequately preparing the worn spots and using the same type grass as originally used.

CRITERION MEASURE:

1. Worn spots are evenly prepared to a depth of 3-4 inches.
2. The same type of grass as originally used is selected.
3. Seeds are sown evenly and at recommended rates.
4. Sod is laid evenly with sides and ends fitting closely together.
5. Sprigs are planted at the proper depth and spacing.
6. Lawn is adequately watered.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Select correct type of grass.	I. Identification of grass originally used	I. Recognizes worn spots in lawn that need reseeding, resodding, or resprigging.
II. Prepare area using tiller, hoes, rakes, etc.	II. Procedures for preparing area	
III. Sow seeds, lay sod, or sprig.	III. Procedures for reseeding, resodding, or resprigging	II. Appreciates a neat, attractive lawn.
IV. Mulch area where seeds are sown.		
V. Water area thoroughly and adequately.		

ANALYSIS

CURRICULUM: Horticulture Technology

SUBJECT AREA: Landscape Maintenance

TASK: (No. D43) Identify and remove poisonous plants.

COMPETENCY:

1. Correctly identify poisonous plants visually and by using resource materials and correctly spell the common names of selected plants.
2. Remove poisonous plants by hand tools, herbicides, or cultural practices.

CRITERION MEASURE:

1. Selected poisonous plants are identified by common names and by using resource materials.
2. Common names of selected plants are spelled correctly.
3. Poisonous plants are killed by selecting methods that best suit the situation.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Identify poisonous plants visually and by using resource materials.	I. Identification characteristics A. Flower B. Leaves C. Stem D. Fruit E. Growth habit F. Odor	I. Realizes that poisonous plants compete for plant nutrients and can also be harmful to man.
II. Spell common names of poisonous plants.	II. Resource materials A. Plant keys B. Books C. Trade magazines D. Horticulture specialists E. Trade catalogs F. Scientific publications	II. Sensitive to foreign plants growing in or with desirable plants.
III. Use appropriate procedures for killing poisonous plants.		III. Displays safety consciousness when working with and eradicating poisonous plants.

OUTLINE OF INSTRUCTIONAL CONTENT (CONTINUED)

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
	III. Spelling techniques	
	A. Memorization	
	B. Association	
	C. Spelling rules	
	D. Latin usage	
	IV. Methodology for killing poisonous plants	
	A. Hand tools	
	1. Hoes	
	2. Rakes	
	3. Mattocks	
	B. Cultural practices	
	C. Herbicides	

ANALYSIS

CURRICULUM: Horticulture Technology **SUBJECT AREA:** Landscape Maintenance

TASK: (No. D44) Treat plant wounds and disease infestations.

COMPETENCY:
1. Scrape and shape plant wounds and disease infestations using appropriate tools and recommended procedures.
2. Select and apply protective substance to wounds and infestations.

CRITERION MEASURE:
1. Plant wounds are correctly scraped and shaped for proper healing using recommended procedures and appropriate tools.
2. Protective substances are selected that properly protect plants.
3. Protective substances are uniformly applied to wounds and infested areas.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Scrape and shape plant wounds and disease infestations.	I. Procedures for scraping and shaping	I. Values plants and enjoys healthy, actively growing plants.
II. Select protective substances.	II. Selecting appropriate tools and using them properly	II. Alert to plant wounds and disease infestations in order for the plant to be repaired before permanent damage results.
III. Apply protective substances.	III. Types of substances and characteristics of each type A. Orange shellac B. Asphaltum paints C. Creasote paints D. Lanolin paints E. Grafting waxes F. Bordeaux paste G. Commercial tree paints	III. Attentive to properly scraping and shaping the wound.
	IV. Application procedures	IV. Appreciates a properly healed plant.

ANALYSIS

CURRICULUM: Horticulture Technology

SUBJECT AREA: Landscape Maintenance

TASK: (No. D45) Repair worn spots in lawn with sod or reseeding.

COMPETENCY: Prepare worn spots for reseeding or sodding. Reseed or lay sod using the same type grass as is growing in remainder of lawn.

CRITERION MEASURE:

1. The prepared seedbed is even and finely textured to a depth of 3-4 inches.
2. Seed is sown evenly and at recommended rates.
3. Sod is laid evenly and level with sides and ends fitting close together.
4. Sod is cut to fit with border of surrounding grass.
5. Sod is pressed down to adhere to ground.
6. Seed is mulched evenly with appropriate material.
7. Remainder of lawn is not damaged when repairing worn spots.
8. Repaired area is adequately watered.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Select correct type of grass.	I. Identification of grass originally used	I. Recognizes worn spots in lawn that need reseeding or resodding.
II. Prepare area using tiller, hoes, rakes, etc.	II. Procedures for preparing area	II. Appreciates a neat, attractive lawn.
III. Sow seed or resod.	III. Procedures for reseeding and resodding	
IV. Mulch area where seed are sown.		
V. Water area adequately.		

ANALYSIS

CURRICULUM: Horticulture Technology

SUBJECT AREA: Landscape Maintenance

TASK: (No. D46) Apply lime and fertilizer according to soil test.

COMPETENCY: Apply recommended amounts of lime and fertilizer per acre based on soil test results using calibrated equipment.

CRITERION MEASURE:

1. Lime and fertilizer amounts per acre are determined according to soil test results.
2. Equipment is properly calibrated for application of determined rates.
3. Equipment is operated according to instructions found in the operator's manual.
4. All safety precautions are observed.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Compute lime and fertilizer amounts per acre.	I. Soil test results A. N, P, K levels B. Fertilizer formulations 1. Dry 2. Liquid C. Liming 1. Amount 2. Timing 3. pH	I. Realizes that better yields and increased profits results from proper amounts of lime and fertilizer.
II. Calibrate equipment. A. Measure specified length of space. B. Set equipment, apply material, and catch it in containers. C. Weigh materials. D. Calculate rate of application and amount that would be applied per acre.	II. Equipment A. Tractor drawn spreaders B. Bulk trucks C. Hand held cyclone spreaders D. 100 foot tape measure E. Scales	II. Follows safety precautions in handling and applying lime and fertilizer.
III. Apply lime and fertilizer.		III. Practices calibration of equipment until it can be done efficiently and rapidly.

OUTLINE OF INSTRUCTIONAL CONTENT (CONTINUED)

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
IV. Practices safety principles. A. Read labels. B. Follow label directions. C. Use proper equipment. D. Wear protective clothing.	IIII. Application of fertilizer and lime A. Equipment calibrated correctly 1. Dry materials a. Pounds/acre b. Placement 2. Liquid materials a. Gallon/acre b. ppm c. Travel rate d. Pump pressure B. Equipment operated efficiently and correctly according to operator's manual	

ANALYSIS

CURRICULUM: Horticulture Technology

SUBJECT AREA: Landscape Maintenance

TASK: (No. D47) Water flower beds, lawns, trees, and shrubbery.

COMPETENCY: Water the lawn, flowers, shrubs, and trees for adequate soil moisture.

CRITERION MEASURE:

1. Lawn and plants are watered only when they need to be watered.
2. No damage or injury is done to the lawn or plants.
3. The correct type of equipment is selected depending on what is to be watered.
4. No more water is applied at any one time than is needed to do an adequate job.
5. Water is evenly distributed to the area.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Determine when to water plants.	I. Factors to consider in watering plants A. Moisture of soil B. Water requirements for different plants C. Time to water 1. Wind 2. Temperature 3. Rain D. Soil drainage	I. Tries to save as much water as possible by watering only when necessary and not overwatering.
II. Water plants.	II. Types of equipment A. Hoses B. Soakers C. Nozzles D. Handwand	II. Sensitive to different water requirements of plants.
III. Measure amount of water used by placing containers in several different places in area of water distribution.		

Outline of Instructional Content (Continued)

Skill/Process	Knowledge/Theory	Value/Attitude Concepts
	III. Watering plants A. Placement of hoses and soakers B. Even distribution of water C. Measuring amount of water applied	

ANALYSIS

CURRICULUM: Horticulture Technology

SUBJECT AREA: Landscape Maintenance

TASK: (No. D48) Mow and trim lawns.

COMPETENCY: Mow and trim lawns using well-maintained equipment.

CRITERION MEASURE:

1. Lawns are mowed and trimmed to the correct height for different types of grass.
2. Blades are sharp and equipment is in good operating condition.
3. Equipment is operated safely according to manufacturer's recommendations.
4. Lawns are edged along walks and driveways and trimmed around trees, buildings, and other obstructions.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Operate equipment.	I. Grasses A. Warm season B. Cool season	I. Appreciates an attractive lawn.
II. Maintain equipment. A. Minor repairs B. Tune-ups C. Sharpen blades D. Clean and lubricate	II. Equipment operation A. Hand-mowers B. Power-mowers C. Trimmers D. Edgers	II. Realizes that sharp blades are essential for a well trimmed lawn and healthy grass.
	III. Adjustments A. Height for various grasses	III. Recognizes the need for well maintained and properly operating equipment.
	IV. Maintenance A. Sharpening B. Lubrication C. Periodic tune-ups	
	V. Mowing and edging procedures	

ANALYSIS

CURRICULUM: Horticulture Technology

SUBJECT AREA: Landscape Maintenance

TASK: (No. D49) Remove dead or unwanted trees or shrubs.

COMPETENCY:
1. Identify unwanted shrubs and trees in an area.
2. Fell and remove trees and shrubs without damaging other vegetation.

CRITERION MEASURE:
1. Dead or unwanted trees and shrubs are identified and marked.
2. Trees are cut using hand or power tools safely and efficiently.
3. Direction of tree fall is controlled in order to damage other trees and vegetation as little as possible.
4. Unwanted shrubs are cut or dug using hand or power tools safely and efficiently.
5. Trees and shrubs are removed from area by hand or with motorized equipment without damaging other vegetation.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Identify dead and unwanted trees and shrubs.	I. Identification of trees and shrubs to be cut and removed A. Dead B. Damaged 1. Disease 2. Insects 3. Storms 4. Man	I. Displays safety consciousness when working with tools and operating equipment.
II. Mark trees and shrubs.	II. Marking trees and shrubs A. Yellow paint B. Ribbon attached to plants C. Notching trees with axe	II. Works carefully to avoid damaging plants that are to be saved.
III. Determine direction of tree fall.	III. Factors in determining direction of tree fall A. Growth habit of tree 1. Natural lean	III. Appreciates an attractive area.
IV. Cut notch on side of tree in direction of fall and finish cutting tree sawing from opposite side.		IV. Enjoys physical work.
V. Cut, dig, push out, or pull up shrubs.		
VI. Trim up trees and large shrubs.		
VII. Remove wood and brush from area.		

OUTLINE OF INSTRUCTIONAL CONTENT (CONTINUED)

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
	2. Branching distribution B. Location of other vegetation, buildings, etc. C. Condition of trees 1. Insects 2. Diseases 3. Storm damage 4. Other damage IV. Tools and equipment (use and characteristics) A. Axes B. Mattocks C. Shovels D. Hand saws E. Chain saws F. Trucks G. Tractors H. Bulldozers V. Safety	

ANALYSIS

CURRICULUM: Horticulture Technology

SUBJECT AREA: Landscape Maintenance

TASK: (No. D50) Cultivate flower beds.

COMPETENCY: Cultivate flower beds using hand tools and rotary tillers.

CRITERION MEASURE:

1. Flower beds are free of weeds and grass.
2. Plants are not damaged during cultivation.
3. Benefits of cultivating flower beds are listed correctly.
4. Hand tools and power equipment are used efficiently and safely.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Rake, hoe, or remove weeds and grass by hand.	I. Benefits of cultivation A. Control weeds and grass B. Increase soil aeration C. Conserve soil moisture	I. Appreciates clean and attractive flower beds.
II. Cultivate flower beds by rotary tiller.	II. Methods A. Hand weeding B. Tools 1. Hoes 2. Rakes 3. Tillers	II. Realizes that flowers grow better when not in competition with weeds and grass.

Appendix

ANALYSIS

CURRICULUM: Horticulture Technology

SUBJECT AREA: Landscape Maintenance

TASK: (No. D51) Transplant trees and/or shrubs.

COMPETENCY: Remove plants from original sites, place in prepared holes, and backfill holes with soil mix.

CRITERION MEASURE:

1. Trees and shrubs are removed from original sites by hand or mechanically without damaging roots, foliage, stems, or trunks.
2. Holes are dug with the correct depth and diameter for selected plants.
3. The equipment used to dig holes mechanically is operated according to manufacturer's recommendations and is used safely.
4. Post hole diggers, picks, shovels, and mattocks are used efficiently and safely.

OUTLINE OF INSTRUCTIONAL CONTENT (SEE ATTACHMENT FOR CONCLUSION OF CRITERION MEASURE)

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Dig shrubs and trees for transplanting.	I. Digging shrubs and trees (procedures) A. Hand tools B. Mechanical equipment	I. Realizes that plants grow best when not crowded and placed in large holes that allow for good drainage.
II. Dig holes for plant setting.	II. Digging tools for plant setting (procedures) A. Hand tools B. Mechanical equipment	II. Handles plants carefully in order not to damage them.
III. Plant shrubs and trees.	III. Planting shrubs and trees (procedures)	III. Displays safety consciousness when using power equipment and hand tools.
IV. Backfill hole.	IV. Backfilling holes (procedures)	

ATTACHMENT TO TASK #D51

CRITERION MEASURE:

5. Plants are placed straight and at the correct depth.
6. Plants are spaced so as not to crowd each other and are attractive.
7. Holes are backfilled carefully in order not to damage roots, stems, bark, or foliage.
8. Soil mix is packed firmly under and around the plant.
9. A mound is constructed around the plant for adequate watering.

ANALYSIS

CURRICULUM: Horticulture Technology

SUBJECT AREA: Landscape Maintenance

TASK: (No. D52) Select and use mulches.

COMPETENCY: Select proper mulches and mulch plantings adequately.

CRITERION MEASURE:
1. Appropriate mulches are selected for designated plantings.
2. Designated areas are mulched at the appropriate time and to the proper depth.
3. Mulches are applied carefully in order not to damage plants.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Select mulch.	I. Types of mulch and characteristics of each A. Bark B. Leaves C. Rocks D. Sphagnum peat moss E. Straw F. Black polyethylene G. Other	I. Realizes the benefits of using mulch around plants.
II. Place mulch under and around plants.	II. Benefits A. Weed control B. Moisture conservation C. Insulation D. Soil conservation E. Attractive landscape	II. Works carefully not to damage plants when applying mulch.

Outline of Instructional Content (Continued)

Skill/Process	Knowledge/Theory	Value/Attitude Concepts
	III. Application A. Time B. Depth C. Fertilization D. Plant type IV. Procedures in applying mulch	

ANALYSIS

CURRICULUM: Horticulture Technology

SUBJECT AREA: Landscape Maintenance

TASK: (No. D53) Repair walkways, driveways, and patios.

COMPETENCY: Estimate costs, select materials, and repair walkways, driveways, and patios using recommended procedures.

CRITERION MEASURE:

1. Necessary types and amounts of materials are chosen for the repair.
2. Material and labor costs are estimated.
3. Damaged surfaces are removed without damaging surrounding surfaces.
4. Damaged surfaces are repaired showing little or no change from original surfaces.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Estimate costs.	I. Costs A. Materials and supplies B. Labor	I. Compiles cost estimates that are realistic.
II. Select materials.	II. Materials A. Wood for forms B. Nails (size and type) C. Brick, concrete mix, stones, rock, etc. D. Appropriate tools to do job	II. Selects materials that are of good quality and of the same type as the original materials.
III. Remove damaged surfaces.	III. Use and operation of tools and equipment	III. Appreciates attractive and well-repaired walkways, patios, and driveways.
IV. Replace surfaces. A. Build forms. B. Lay brick, stone, pour concrete, etc.	IV. Procedures necessary for repairing walkways, driveways, and patios	IV. Recognizes when surfaces should be repaired.

ANALYSIS

CURRICULUM: Horticulture Technology **SUBJECT AREA:** Propagation

TASK: (No. E54) Select proper propagating stock.

COMPETENCY: Select propagating stock for successful propagation of plants.

CRITERION MEASURE:
1. Appropriate stock is selected that will propagate successfully.
2. Propagation stock is selected at the appropriate time of the year.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Select propagation stock.	I. Proper identification of plants to be propagated A. Growth habit B. Flower characteristics C. Flower production D. Leaf characteristics E. Fruit F. Disease symptoms G. General health II. Timing A. Plant types and best time of year to propagate III. Conditions of stock plants and location of cuttings taken from stock plants A. Health	I. Sensitive to selecting stock that is healthy and has a very good chance of propagating.

OUTLINE OF INSTRUCTIONAL CONTENT (CONTINUED)

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
	B. Disease and insect free C. Lateral versus terminal cutting D. Age of stock plants E. Low nitrogen and high carbohydrate content in stems	

ANALYSIS

CURRICULUM: Horticulture Technology **SUBJECT AREA:** Propagation

TASK: (No. E55) Propagate different types of plants at the correct time using proper techniques and procedures.

COMPETENCY: Propagate different types of plants at the correct time using recommended techniques and procedures.

CRITERION MEASURE:

1. The appropriate method for propagation of selected plants is determined.
2. Plant material and media are properly prepared for the propagation of selected plants.
3. Selected plants are propagated at the correct time using recommended techniques and procedures.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Select propagation technique. II. Prepare plant material. III. Prepare media material. IV. Propagate plants.	I. Techniques A. Seeds B. Cuttings 1. Stem 2. Leaf 3. Leaf-bud 4. Root C. Grafting D. Layering E. Specialized structures II. Methods A. Procedures B. Equipment C. Media 1. Types 2. Characteristics 3. Functions D. Timing	I. Shows interest in learning as much as possible about different propagating techniques and which techniques are best for various types of plants. II. Practices propagation techniques whenever possible.

ANALYSIS

CURRICULUM: Horticulture Technology

SUBJECT AREA: Propagation

TASK: (No. E56) Have knowledge of propagating structures and equipment.

COMPETENCY: List the characteristics of the various types of propagating structures and operate the structures and equipment.

CRITERION MEASURE:

1. The types of propagating structures are listed and characteristics of each type are correctly given.
2. The type(s) of propagating structure is selected to best suit the needs or purposes of the situation.
3. Propagating structures and the supporting equipment are operated correctly to insure successful propagation of plants.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. List types of propagating structures and provide characteristics of each. II. Operate structures. A. Maintain range of required temperatures day and night. B. Provides proper lighting. C. Set up and maintain watering schedule. D. Maintain soil temperatures at acceptable range.	I. Structures (characteristics) and operation) A. Cold frames B. Hotbeds C. Greenhouses 1. Glass 2. Plastic 3. Fiberglass D. Lathhouses II. Equipment operation A. Ventilating B. Circulating C. Heating D. Watering E. Lighting	I. Realizes that proper heat and light are necessary for successful propagation of plants. II. Enjoys the challenge of setting up and maintaining the proper conditions in propagating structures for successful propagation.

ANALYSIS

CURRICULUM: Horticulture Technology **SUBJECT AREA:** Propagation

TASK: (No. E57) Have knowledge of propagating systems.

COMPETENCY: Identify, install, and operate propagating systems.

CRITERION MEASURE:

1. Types of propagating systems are correctly identified.
2. Propagating systems are installed according to manufacturer's recommendations.
3. The type(s) of system is selected that best fits the needs of the situation.
4. Propagating systems are operated properly for successful propagating of plants.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Identify propagating systems. II. Install propagating systems. A. Lay pipes. B. Connect water source. C. Wire electrical system. D. Install nozzles. E. Install and set timers and other controls. III. Operate propagating systems.	I. Mist systems A. Constant B. Intermittant 1. Nozzles a. Oil-burner b. Deflection c. Spacing and placement 2. Controls a. Electronic leaf b. Mist-o-matic c. Time clocks 1. Day/night 2. Short interval 3. Other a. Strainers b. Solenoid valves c. Gate valves	I. Shows interest in learning as much as possible about propagating systems. II. Participates actively in laboratory experiences on propagating systems. III. Asks questions on areas not knowledgeable about. IV. Accepts responsibility on assignments.

OUTLINE OF INSTRUCTIONAL CONTENT (CONTINUED)

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
	II. Installation and operating procedures	

ANALYSIS

CURRICULUM: Horticulture Technology **SUBJECT AREA:** Propagation

TASK: (No. E58) Maintain and repair propagating structures and equipment.

COMPETENCY: Maintain and repair propagating structures and equipment, using manufacturer's recommendations.

CRITERION MEASURE:
1. Mechanical and structural problems are identified.
2. Appropriate materials, tools, and equipment are selected for repairs.
3. Mechanical and structural problems are properly repaired according to manufacturer's recommendations.
4. General maintenance program is set up and followed.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Identify problem.	I. Problem identification A. Regular inspection B. Observation	I. Realizes that if propagation is to be done successfully, propagating structures and equipment must be maintained regularly and be in good repair.
II. Select materials, tools, and equipment.	II. Basic repair A. Techniques 1. Carpentry 2. Plumbing 3. Electrical B. Materials C. Tools D. Equipment	II. Appreciates well-maintained tools, equipment, and structures.
III. Repair structures and equipment.	III. Maintenance program A. Maintenance schedules B. Regular inspection C. Record and filing system	III. Alert to equipment not functioning properly and checks scheduled maintenance charts to make sure maintenance is carried out.
IV. Set up maintenance program.		

ANALYSIS

CURRICULUM: Horticulture Technology **SUBJECT AREA:** Greenhouse Growing of Plants

TASK: (No. F59) Identify media materials.

COMPETENCY: Visually identify the various types of media materials and list the characteristics of each type.

CRITERION MEASURE:
1. Types of media materials are correctly identified visually.
2. Characteristics of the various types of media materials are listed correctly.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Identify media materials.	I. Types of media materials A. Peat B. Perlite C. Vermiculite D. Sand E. Soil F. Hulls G. Bark H. Other	I. Recognizes that there are differences in media materials, and that some types are better for some plants than are other types.
II. List the characteristics of media materials.	II. Characteristics A. Weight B. Water holding capacity C. Aeration D. Drainage E. Other (i.e. pH)	

ANALYSIS

CURRICULUM: Horticulture Technology

SUBJECT AREA: Greenhouse Growing of Plants

TASK: (No. F60) Shred or screen different media materials.

COMPETENCY: Shred and screen different media materials by using hand tools or mechanical equipment.

CRITERION MEASURE:
1. Media materials are adequately shredded by hand tools or mechanical equipment.
2. Media materials are screened for sizing by using hand or mechanical screeners.
3. Foreign materials are identified and removed from media materials.
4. Mechanical equipment is operated according to manufacturer's recommendations.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Shred media.	I. Shredding	I. Realizes that properly shredded and screened media is best for optimum plant growth.
A. Use hand tools.	A. Use of hand tools	
B. Operate mechanical shredder.	1. Shovel	
	2. Hoe	
	B. Mechanical shredder (operate according to owner's manual)	II. Recognizes foreign material and makes sure that they are removed from media materials.
	II. Screening	
	A. Hand screener	
	B. Mechanical screener (operate according to owner's manual)	

ANALYSIS

CURRICULUM: Horticulture Technology **SUBJECT AREA:** Greenhouse Growing of Plants

TASK: (NO. F61) Determine soil mix for specific plant requirements.

COMPETENCY: Select soil mix for specific plant requirements and mix thoroughly using hand tools or mechanical equipment.

CRITERION MEASURE:

1. The soil mix for specific plant requirements is determined for optimum plant growth.
2. The materials are uniformly mixed by using hand tools and mechanical equipment.
3. Soil mixture is free of lumps, individual ingredients or foreign materials.
4. Mechanical equipment is operated according to manufacturer's recommendations.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Select soil mixes. II. Uniformly mix the ingredients. A. Use hand tools. B. Operate rotary tiller. C. Operate concrete mixer. D. Operate tractor and front-end loader.	I. Factors in determining soil mix A. Type of plants 1. Propagation 2. Growing a. Greenhouse b. Container stock 3. Size 4. Age B. Plant requirements 1. Water 2. Aeration 3. Drainage 4. Fertility C. Cost D. Characteristics of media types	I. Completes assignments properly on determining soil mixes for different plant requirements. II. Demonstrates a commitment to uniformly mix the soil ingredients.

Outline of Instructional Content (Continued)

Skill/Process	Knowledge/Theory	Value/Attitude Concepts
	II. Use and operation of tools and equipment for mixing media	

ANALYSIS

CURRICULUM: Horticulture Technology

SUBJECT AREA: Greenhouse Growing of Plants

TASK: (No. F62) Sterilize mixed soils.

COMPETENCY: Sterilize soil mixtures using chemicals and steam.

CRITERION MEASURE:

1. Soil media is sterilized correctly resulting in no weed growth and no root diseases.
2. The sterilization method is selected that is most appropriate to the situation.
3. Recommended procedures for the different methods are followed.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Select method that best fits the situation.	I. Sterilization selection factors A. Cost B. Size of operation C. Type of equipment and facilities	I. Realizes that there will be less disease and weed problems with good sterilization techniques.
II. Sterilize media.	II. Methods and procedures of sterilizing media A. Chemicals 1. Types a. Formaldehyde drench b. Tear gas c. Methyl bromide d. DD e. Vapam f. Chloropicrin 2. Equipment (use and operation)	II. Carefully implements sterilization procedures for effective results.

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OUTLINE OF INSTRUCTIONAL CONTENT (CONTINUED)

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
	B. Steam 1. Time 2. Temperature 3. Equipment (use and operation)	

ANALYSIS

CURRICULUM: Horticulture Technology

SUBJECT AREA: Greenhouse Growing of Plants

TASK: (No. F63) Apply correct amendments to soil mix.

COMPETENCY: Select and apply amendments to soil mix by using hand tools or mechanical equipment.

CRITERION MEASURE:

1. Soil amendments are selected that best meet the soil and plant requirements.
2. Soil amendments are uniformly mixed with the soil.
3. Mechanical equipment is operated according to manufacturer's recommendations.
4. Total soil mixture is free of lumps, individual ingredients or foreign material.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Select soil amendments. II. Apply soil amendments to soil mix. A. Use hand tools. 1. Shovels 2. Rakes 3. Hoes B. Operate mechanical equipment. 1. Concrete mixer 2. Rotary tiller 3. Tractor mounted front-end loader 4. Bobcat loader	I. Types of soil amendments A. Inorganic 1. Sand 2. Perlite 3. Vermiculite 4. Fertilizers B. Organic 1. Humus 2. Manure 3. Peat 4. Bark 5. Hulls II. Factors in selection of soil amendments A. Cost B. Amendment characteristics C. Plant types	I. Realizes that proper plant growth requires the correct application of soil amendments in the media.

Outline of Instructional Content (Continued)

Skill/Process	Knowledge/Theory	Value/Attitude Concepts
	D. Plant requirements	
	III. Use and operation of tools and equipment to apply amendments to soil mix	

ANALYSIS

CURRICULUM: Horticulture Technology

SUBJECT AREA: Greenhouse Growing of Plants

TASK: (No. F64) Fill benches, pots, and flats.

COMPETENCY: Fill benches, pots, and flats with soil mix.

CRITERION MEASURE:

1. Benches, pots, and flats are filled to the proper level and firmed.
2. Tools and equipment are used and operated efficiently according to manufacturer's recommendations.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Fill benches, pots, and flats with soil mix.	I. Filling containers A. Media B. Tools and equipment (use and operation) 1. Wheelbarrows 2. Shovels 3. Front-end loaders 4. Potting machines 5. Hand tools	I. Accepts responsibility for adequately filling benches, pots, and flats with soil mix.
II. Smooth, level, and firm soil mix.		

ANALYSIS

CURRICULUM: Horticulture Technology

SUBJECT AREA: Greenhouse Growing of Plants

TASK: (No. F65) Make propagation and seed sowing schedules.

COMPETENCY: Prepare schedules for propagating plants and for sowing seeds in accordance with space, labor, time, and plant requirements.

CRITERION MEASURE:

1. Propagation and seed sowing schedules are made which coordinate available space, labor, time, and plant requirements.
2. Seed sowing schedules are coordinated with seasonal demand.
3. Adequate records are kept for future reference.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Prepare propagation and seed sowing schedules.	I. Factors concerning schedules for propagating and for sowing seeds A. Available space B. Required labor and availability of labor C. Time required 1. Plant type 2. Propagation technique 3. Desired end product D. Seasonal demands 1. Type plants 2. Size or age	I. Recognizes the need to have plants available when customers demand them.
II. Record dates of propagating stock and sowing seeds.	II. Recordkeeping A. Plant name and type B. Date propagated or seed sown C. Date plants ready for sale	II. Uses records as a guide for future planning.

ANALYSIS

CURRICULUM: Horticulture Technology

SUBJECT AREA: Greenhouse Growing of Plants

TASK: (No. F66) Sow seeds in appropriate containers.

COMPETENCY: Sow seeds in appropriate containers by hand or mechanically.

CRITERION MEASURE:
1. Appropriate sowing techniques and methods are chosen for selected seeds.
2. Appropriate containers are selected for sowing seeds.
3. Seeds are sown evenly and at the proper depths.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Select sowing technique.	I. Techniques A. Rows B. Broadcast C. Individual pots D. Mechanical seeders	
II. Select sowing method.	II. Methods A. Hand B. Machine	
III. Select containers. IV. Sow seeds.	III. Containers (characteristics) A. Pots 1. Clay 2. Plastic 3. Peat 4. Other	

OUTLINE OF INSTRUCTIONAL CONTENT (CONTINUED)

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
	B. Flats 1. Plastic 2. Wooden 3. Other IV. Seed sowing procedures	

ANALYSIS

CURRICULUM: Horticulture Technology

SUBJECT AREA: Greenhouse Growing of Plants

TASK: (No. F67) Make plant cuttings and put in appropriate containers and media.

COMPETENCY: Take, prepare, and put cuttings in prepared containers and media.

CRITERION MEASURE:

1. Cuttings from selected plants are taken at the correct time of year with established procedures for taking different kinds of cuttings followed.
2. Cuttings are prepared for propagation including removing leaves and stems and using rooting compound when appropriate.
3. Cuttings are put in containers and media using recommended procedures.
4. Safety practices are followed when using knives and other propagating tools.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Take cuttings from selected plants.	I. Obtaining cuttings A. Plant characteristics B. Timing C. Types 1. Stem 2. Leaf 3. Leaf-bud 4. Root	I. Displays safety consciousness in handlings knives and other propagating tools.
II. Prepare cuttings. A. Remove excess stem and leaves. B. Dip cuttings in rooting hormone when appropriate.	II. Preparing cuttings A. Procedures for various types B. Rooting hormones (types and benefits)	II. Shows awareness of the importance of taking and preparing good cuttings.
		III. Follows recommended procedures in taking, preparing, and rooting cuttings

OUTLINE OF INSTRUCTIONAL CONTENT (CONTINUED)

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
III. Put cuttings in soil mix. A. Stick cuttings. B. Prepare leaf and root cuttings.	III. Putting cuttings in soil mix A. Procedures for different types IV. Safety practices involving knives and other propagating tools	

ANALYSIS

CURRICULUM: Horticulture Technology

SUBJECT AREA: Greenhouse Growing of Plants

TASK: (No. F68) Transplant seedlings to pots, flats, etc.

COMPETENCY: Select appropriate containers, fill to appropriate level and transplant seedlings into containers.

CRITERION MEASURE:

1. Appropriate containers are selected for the various types of transplants.
2. Containers are filled with soil mix to within approximately ¼" of top of container, and soil mix is firmed and leveled.
3. Small holes are made in soil mix with correct spacing and depth.
4. Seedlings are pulled from flat, pots, etc., inserted into prepared containers at the proper depth and firmed in and watered without damaging the plants.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Select containers.	I. Factors in selecting containers A. Size for different types of transplants B. Eventual use of plants C. Types of containers 1. Peat 2. Clay 3. Ceramic 4. Other	I. Demonstrates patience in transplanting seedlings in order not to damage them.
II. Fill containers with soil mix to within ¼" of top of container. A. Firm soil mix. B. Level medium. C. Prepare holes.	II. Transplants handled by the leaves in order not to damage them	II. Realizes that good transplants is the key to a profitable operation.
III. Transplant seedlings. A. Pull from containers. B. Insert in prepared holes. C. Firm medium around plant. D. Water.	III. Transplanting procedures	

ANALYSIS

CURRICULUM: Horticulture Technology

SUBJECT AREA: Greenhouse Growing of Plants

TASK: (No. F69) Label planted specimens.

COMPETENCY: Correctly label planted specimens.

CRITERION MEASURE:

1. Planted specimens are properly labeled with the correct common and scientific names.
2. Labels are neat, large enough to be easily read and contain other information when appropriate, i.e., height, light requirements, price, etc.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Label plants.	I. Types of labels A. Plastic B. Wood	I. Shows concern for the accuracy of labels.
	II. Types of markers A. Pencil B. Nursery marker	II. Organizes and arranges plants for attractive displays.
	III. Reasons for labeling A. Customer desires B. Similar plant appearances C. Plant identification D. Attractiveness E. Well-organized and arranged plants F. Information on plant characteristics	
	IV. Labeling procedures	

ANALYSIS

CURRICULUM: Horticulture Technology

SUBJECT AREA: Greenhouse Growing of Plants

TASK: (No. F70) Properly water greenhouse stock.

COMPETENCY: Water greenhouse stock manually and by using automated equipment.

CRITERION MEASURE:

1. Schedules for adequately watering various types of greenhouse stock are developed.
2. Plants are watered adequately without damaging them.
3. Timers are set according to established watering schedules.
4. Water conservation practices are followed.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Develop schedules for watering.	I. Factors in developing watering schedules A. Time of watering B. Amount of water required C. Type of plants D. Method of watering E. Greenhouse type and layout of benches, etc.	I. Formulates watering schedules that are efficient and practical.
II. Water plants manually and by setting automatic timers.	II. Methods of watering (procedures and practices) A. Overhead 1. Manual 2. Surface irrigation 3. Plastic tubes a. Collapsible tubes b. Plastic pipe	II. Demonstrates a commitment to conserving water.
III. Practice water conservation measures.		III. Sensitive to water stress in plants.
		IV. Realizes that adequate watering is essential to healthy, active growing plants.

OUTLINE OF INSTRUCTIONAL CONTENT (CONTINUED)

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
	c. Ooze hoses d. Leader tubes B. Subirrigation 1. Manual 2. Constant-level III. Setting timers A. Watering schedules B. Follow directions in operator's manual IV. Conservation measures A. Provide no more water than plants require B. Repair leaking hoses, pipes, valves, etc. C. Efficient layout of plants	

ANALYSIS

CURRICULUM: Horticulture Technology

SUBJECT AREA: Greenhouse Growing of Plants

TASK: (No. F71) Prune and thin plants.

COMPETENCY: Prune plants at correct time using recommended procedures. Thin plants by hand.

CRITERION MEASURE:

1. Correct times are identified for pruning various species of plants.
2. Appropriate tools are selected for the type of pruning to be done.
3. Correct pruning procedures are followed for the method of pruning done.
4. Reasons for pruning are correctly identified.
5. The proper pruning method is selected for the condition and type of plant.
6. Plants are thinned to a recommended number in a specified space by removing the least desirable specimens.
7. Reasons for thinning plants are correctly listed.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Select pruning tools for the appropriate pruning tasks to be performed.	I. Pruning equipment (characteristics and uses) A. Hand shears B. Loppers C. Saws D. Knives E. Axes	I. Realizes that customers prefer well pruned, healthy plants. II. Enjoys working with plants that are healthy, actively growing and attractive.
II. Prune plants following recommended procedures.	II. Methods of pruning (characteristics and methodology) A. Selective B. Heading back	III. Demonstrates a commitment to following recommended procedures in pruning and thinning plants
III. Thin plants by pulling up by hand the most undesirable specimens.	III. Timing factors A. Plant types B. Flowering period C. Plant hardiness D. Plant dormancy	

OUTLINE OF INSTRUCTIONAL CONTENT (CONTINUED)

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
	E. Labor availability IV. Reasons for pruning A. Preserve plant health B. Remove broken or dead limbs C. Emphasize growth habit D. Sculpture plants E. Restrict plant growth F. Repair damaged or diseased plants G. Encourage flowering H. Reduce danger on large plants and trees V. Thinning plants A. Methodology B. Plants removed 1. Diseased 2. Damaged 3. Small, spinely plants 4. Plants attacked by insects C. Reasons for thinning 1. Correct stand 2. Prevent lodging 3. Reduce disease 4. Remove dead and damaged plants 5. Encourage healthy, actively growing plants	

ANALYSIS

CURRICULUM: Horticulture Technology

SUBJECT AREA: Greenhouse Growing of Plants

TASK: (No. F72) Fertilize plants.

COMPETENCY: Apply correct amounts of fertilizer by hand and by mechanical application at the best times for optimum plant growth.

CRITERION MEASURE:

1. Fertilizer schedules and rates are determined according to plant requirements.
2. Equipment is correctly calibrated.
3. Type of fertilizer and correct analysis is selected based on plant requirements and soil test results.
4. Fertilizer is applied without damaging the plants.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Determine fertilization schedules and rates of application.	I. Fertilization schedules and application rates A. Plant requirements B. Type of fertilizer C. Rate of growth desired	I. Recognizes that better plants and increased profits result from a good fertilization program.
II. Select type of fertilizer and correct analysis.	II. Choice of fertilizer A. Minerals needed B. Application method C. Other fertilizer effects D. Relative costs E. Plant requirements	II. Carefully applies fertilizer in order not to damage plants.
III. Calibrate equipment.	III. Calibration of equipment for mechanical application	

OUTLINE OF INSTRUCTIONAL CONTENT (CONTINUED)

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
IV. Apply fertilizer. A. Hand application B. Mechanical	IV. Application procedures A. Dry 1. Granules 2. Slow-release 3. Tablets B. Liquid 1. Pump 2. Injector	

ANALYSIS

CURRICULUM: Horticulture Technology

SUBJECT AREA: Greenhouse Growing of Plants

TASK: (No. F73) Pinch potted plants.

COMPETENCY: Pinch potted plants manually and chemically.

CRITERION MEASURE:
1. Potted plants are pinched manually and chemically at the correct time without damaging plants.
2. Reasons for pinching plants are listed correctly.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Pinch potted plants manually and chemically.	I. Techniques of pinching plants A. Manually 1. Type of plant 2. Timing 3. Plant part and amount B. Chemically 1. Type chemicals 2. Timing 3. Application (method and rate) II. Reasons for pinching plants A. Properly shapes plants B. Promotes flowering C. Repairs damaged plants from insects and diseases	I. Shows awareness of the importance of pinching plants. II. Appreciates well-shaped and healthy plants.

ANALYSIS

CURRICULUM: Horticulture Technology

SUBJECT AREA: Greenhouse Growing of Plants

TASK: (No. F74) Control temperature with fans and heaters.

COMPETENCY: Control temperature in the greenhouse by operating fans and heaters manually and by setting automatic timers.

CRITERION MEASURE:
1. Temperature requirements (day/night) are determined for selected plants.
2. Correct temperatures are maintained by manual operation and setting automatic timers for fans and heaters.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Determine temperature requirements.	I. Temperature requirements A. Kind of plant B. Type of desired growth	I. Realizes the proper temperatures are critical for efficient growth of plants.
	II. Regulations A. Temperature B. Timing C. Duration	II. Demonstrates self-reliance in operating equipment for controlling temperatures.
III. Operate equipment manually and by setting automatic timers.	III. Equipment - operation and use A. Types 1. Manual 2. Automatic B. Adjustment C. Maintenance	

ANALYSIS

CURRICULUM: Horticulture Technology

SUBJECT AREA: Greenhouse Growing of Plants

TASK: (No. F75) Control humidity with ventilating fans and humidifiers.

COMPETENCY: Control humidity with ventilating fans and humidifiers by operating equipment manually and by setting automatic timers.

CRITERION MEASURE:
1. Proper relative humidity level is determined for selected plants.
2. Proper relative humidity level is maintained by manual operation and setting automatic timers for ventilating fans and humidifiers.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Identify humidity requirements for different plant species.	I. Humidity requirements A. Bedding plants B. Vegetable plants C. Flowering plants D. Ornamental plants	I. Realizes that plant growing efficiency is reduced because of improper humidity.
II. Manually operate switches to maintain proper humidity.	II. Timing for turning fans or humidifiers on and off	
III. Set automatic controls for maintaining proper humidity.	III. Equipment A. Types of equipment 1. Manual 2. Automatic B. Procedures for operating equipment	

Appendix

ANALYSIS

CURRICULUM: Horticulture Technology

SUBJECT AREA: Greenhouse Growing of Plants

TASK: (No. F76) Control the type and amount of light.

COMPETENCY: Control the type and amount of light necessary for greenhouse production.

CRITERION MEASURE:

1. Light meters are correctly read.
2. Shade cloth is used at the correct time to control the amount of light required for selected greenhouse crops.
3. Artificial lighting (incandescent and fluorescent) is properly used to control the type and amount of light required for selected greenhouse crops.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Use and read a light meter.	I. Light sources A. Natural B. Artificial 1. Incandescent 2. Fluorescent	I. Recognizes that use of proper lighting is essential for profitable production of greenhouse crops.
II. Cover greenhouse with shade cloth.	II. Light characteristics A. Intensity 1. Light meters 2. Foot-candles B. Duration 1. Photoperiodism a. Short-day b. Long-day c. Indeterminate C. Quality 1. Red wavelengths 2. Red-orange wavelengths	II. Sensitive to light requirements of different varieties of plants.
III. Use artificial lights.		

OUTLINE OF INSTRUCTIONAL CONTENT (CONTINUED)

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
	III. Light requirements for plants A. Plant types B. Timing for seasonal use C. Desired growth and blooming IV. Light control A. Use of light meter B. Methods 1. Shade cloth (installation and removal procedures) 2. Artificial light (incandescent fluorescent) C. Timing	

ANALYSIS

CURRICULUM: Horticulture Technology

SUBJECT AREA: Greenhouse Growing of Plants

TASK: (No. F77) Force bulbs.

COMPETENCY: Force bulbs (specialized stems and roots) into blooms at specified times.

CRITERION MEASURE: Selected specialized stems and roots are forced into bloom by the regulation of light, temperature, moisture, and nutrition.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Regulate light, temperature, moisture, and nutrition for forcing bulbs.	I. Plant types A. Lily B. Tulip C. Daffodils D. Crocus E. Hyacinth F. Minor bulbs	I. Enjoys the challenge of forcing specialized stems and roots to bloom at specified times.
	II. Controlling factors A. Light B. Temperature C. Moisture D. Nutrition	II. Realizes that timing is critical in having plants available for customers at seasonal times.
	III. Manipulation of controlling factors	

ANALYSIS

CURRICULUM: Horticulture Technology

SUBJECT AREA: Greenhouse Growing of Plants

TASK: (No.F78) Force potted plants to bloom at seasonal times.

COMPETENCY: Force potted plants to bloom at seasonal times.

CRITERION MEASURE: Selected potted plants are forced into bloom at seasonal times by the regulation of light, temperature, moisture, and nutrition.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Regulate light, temperature, moisture, and nutrition for forcing potted plants.	I. Pot plants A. Chrysanthemums B. Poinsettias C. Azaleas D. Hydrangeas E. Other II. Controlling factors A. Light B. Temperature C. Moisture D. Nutrition III. Manipulation of controlling factors	I. Shows awareness of the importance of timing in having forced plants available for seasonal sales. II. Enjoys the challenge of manipulating the controlling factors in forcing potted plants to bloom.

ANALYSIS

CURRICULUM: Horticulture Technology

SUBJECT AREA: Greenhouse Growing of Plants

TASK: (No. F79) Identify weeds and control them by chemicals, plastic, and mechanical means.

COMPETENCY: Identify and spell the common names of weeds and select appropriate control measures for their eradication.

CRITERION MEASURE:

1. Selected weeds are identified by common names visually and by using resource materials.
2. Common names of selected weeds are spelled correctly.
3. Appropriate control methods are selected for the eradication of selected weeds.
4. Equipment is properly calibrated.
5. Control measures are safely and correctly applied at the correct rates for chemical controls.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Identify weeds visually and by using resource materials.	I. Identification of weeds A. Characteristics 1. Flower 2. Leaves 3. Fruit 4. Growth habit 5. Stems 6. Other B. Resource materials 1. State laboratory 2. Books 3. Keys 4. Horticulture specialists 5. Trade magazines and catalogs 6. Scientific publications	I. Recognizes the need to control weeds in greenhouses. II. Follows all safety precautions and warnings when administering control measures.

OUTLINE OF INSTRUCTIONAL CONTENT (CONTINUED)

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
II. Spell common names of selected weeds.	II. Spelling techniques A. Memorization B. Association C. Spelling rules D. Latin usage	
III. Select appropriate control methods.	III. Control methods A. Hand B. Mulches C. Plastic D. Chemicals 1. Types 2. Application E. Equipment 1. Types 2. Calibration	
IV. Calibrate equipment.	IV. Rates of application for chemical controls A. Labels B. Tested and proved rates by research labs	
V. Apply chemical control measures safely and at the correct rates.	V. Safety precautions	

ANALYSIS

CURRICULUM: Horticulture Technology

SUBJECT AREA: Greenhouse Growing of Plants

TASK: (No. F80) Fumigate greenhouse.

COMPETENCY: Safely fumigate greenhouses using recommended procedures.

CRITERION MEASURE:

1. Appropriate fumigants and fumigation methods are selected for greenhouse fumigation.
2. Equipment is correctly calibrated.
3. Fumigants are applied correctly and at the appropriate rates.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Select fumigant.	I. Fumigants A. Types B. Label information	I. Recognizes the need to eradicate pests from greenhouses.
II. Select appropriate control methods.	II. Methods A. Hydraulic spraying B. Fumigators C. Dusters D. Soil drenches E. Aerosols F. Steam line vaporization G. Foggers	II. Displays safety consciousness in applying chemicals.
III. Calibrate equipment.	III. Equipment A. Types B. Calibration C. Operation	

OUTLINE OF INSTRUCTIONAL CONTENT (CONTINUED)

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
IV. Operate equipment and apply fumigants at correct rates, observing safety warnings and precautions.	IV. Application rates A. Type of fumigant B. Labels C. Recommended rates from laboratory tests	
	V. Safety precautions	

Appendix

ANALYSIS

CURRICULUM: Horticulture Technology

SUBJECT AREA: Greenhouse Growing of Plants

TASK: (No. F81) Identify, remove, and destroy diseased plants.

COMPETENCY: Identify, remove, and destroy diseased plants.

CRITERION MEASURE:
1. Diseased plants are correctly identified visually and by using resource materials.
2. Diseased plants are removed and properly destroyed.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Identify diseased plants.	I. Identification A. Symbols 1. Growth irregularities 2. Discoloration 3. Dropping of foliage 4. Adhesions 5. Other	I. Recognizes the need to identify diseased plants and to rid the greenhouse of the source of the infestation.
	B. Resource materials 1. Books 2. Keys 3. Horticulture specialists 4. Scientific journals 5. Trade magazines and journals 6. Research laboratories 7. Other	II. Sensitive to positive identification of diseased plants as quickly as possible.

OUTLINE OF INSTRUCTIONAL CONTENT (CONTINUED)

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
II. Remove and destroy diseased plants.	II. Removal procedures	
	III. Eradication procedures A. Burying B. Burning C. Other	

ANALYSIS

CURRICULUM: Horticulture Technology

SUBJECT AREA: Greenhouse Growing of Plants

TASK: (No. F82) Control plant insects and diseases with chemicals.

COMPETENCY: Apply control measures on weeds, pests, and diseases using chemicals and other measures where appropriate. Calibrate equipment.

CRITERION MEASURE:

1. Chemical control measures applied correctly following label instructions.
2. Sprayers, dusters, and foggers are operated according to manufacturer's recommendations and calibrated correctly.
3. Biological, cultural, sanitation, and chemical control measures are used where appropriate and recommended procedures followed.
4. All safety precautions are observed.
5. Equipment is thoroughly cleaned after each use, removing all residues.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Read and follow labels for chemical control measures.	I. Chemical labels A. Directions B. Precautions C. Controls D. Effective dates of use E. Other information	I. Complies with warnings and other instructions on all labels.
II. Set up, adjust, and operate sprayers, dusters, and foggers.	II. Setting up, adjusting, calibrating, and operating equipment A. Sprayers B. Dusters C. Foggers	II. Displays safety consciousness in handling and using chemicals.
III. Calibrate equipment.	III. Control measures (recommended procedures) A. Biological	III. Only uses control measures when necessary.
IV. Implement biological, cultural, sanitation, and chemical control measures where applicable.		
V. Clean equipment after each use. A. Wash equipment thoroughly with soap and water. B. Run water through nozzles.		

OUTLINE OF INSTRUCTIONAL CONTENT (CONTINUED)

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
C. Dry excess water with clean cloth and allow to dry thoroughly.	B. Cultural C. Chemical 1. Mechanical application 2. Hand application D. Sanitation	

ANALYSIS

CURRICULUM: Horticulture Technology

SUBJECT AREA: Greenhouse Growing of Plants

TASK: (No. F83) Remove plants from bed to sell.

COMPETENCY: Remove plants from bed and place in boxes or other inexpensive containers for ease of transporting by customers.

CRITERION MEASURE:

1. Plants are removed from beds very carefully in order not to damage roots or foliage.
2. Appropriate tools are used for removing plants.
3. Plants are placed in containers carefully to avoid injury.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Remove plants from bed. II. Place in appropriate containers.	I. Type of plants growing in beds to sell directly to public II. Removal procedures III. Procedures for placing plants in containers	I. Selects plants that are vigorous and attractive. II. Carefully removes plants from bed to avoid damage or injury. III. Sensitive to condition of plants at time of sell.

ANALYSIS

CURRICULUM: Horticulture Technology

SUBJECT AREA: Greenhouse Growing of Plants

TASK: (No. F84) Select proper pot sizes for replanting plants.

COMPETENCY: Select proper pots and pot sizes for replanting plants.

CRITERION MEASURE:
1. Proper pots are selected for the type plants and how the plants will be used.
2. Proper pot sizes are selected for various plants.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Select appropriate pots for selected plants.	I. Types of pots - characteristics A. Clay B. Plastic C. Peat D. Wood E. Metal F. Ceramic G. Other II. Factors in selecting appropriate pots and pot sizes A. Plant types B. Plant use C. Root system D. Length of time plant to remain in pot E. Drainage requirements	I. Recognizes that plants grow best in pots that are large enough for good root development. II. Assists customer in selecting pots that fit room decors and how plants will be used.

ANALYSIS

CURRICULUM: Horticulture Technology

SUBJECT AREA: Field Growing of Plants

TASK: (No. G85) Take soil sample and interpret data.

COMPETENCY: Take soil samples according to established procedures, fill out information sheet, submit samples to a soil testing laboratory and interpret the returned results.

CRITERION MEASURE:

1. Soil samples are taken according to established and approved procedures.
2. Information sheets are completed giving information on land use and fertilization and liming records.
3. Soil samples and information sheets are mailed to state or private soil testing laboratories.
4. Soil test results are interpreted and fertilization and liming amounts are determined.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Take a soil sample. A. Obtain soil from various locations in a field and put in bucket. B. Mix the soil thoroughly. C. Pour the mixed soil into the sample box. II. Fill out the information sheet. III. Label and date sample. IV. Submit information sheet and soil sample to appropriate soil testing laboratory.	I. Soil sampling A. Tools 1. Soil tube 2. Soil auger 3. Trowel 4. Shovel 5. Bucket B. Sampling techniques 1. Representative areas of field 2. Dry soil free of lumps and rocks II. Completing information sheet A. Problem areas B. Land use 1. Past 2. Present	I. Complies with recommended practices in taking soil tests in order to receive accurate results.

OUTLINE OF INSTRUCTIONAL CONTENT (CONTINUED)

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
	3. Future C. Cultivation practices D. Fertilization and liming record III. Interpreting test results A. Nutrient symbols B. Sources of recommended nutrients C. Determining amounts of fertilizer and lime to apply per acre based on recommendations D. pH	

ANALYSIS

CURRICULUM: Horticulture Technology

SUBJECT AREA: Field Growing of Plants

TASK: (No. G86) Calibrate spreader and apply fertilizer and lime according to soil test data.

COMPETENCY: Apply recommended amounts of lime and fertilizer per acre based on soil test results using calibrated equipment.

CRITERION MEASURE:

1. Lime and fertilizer amounts per acre are determined according to soil test results.
2. Equipment is properly calibrated for application of determined rates.
3. Equipment is operated according to instructions found in the operator's manual.
4. All safety precautions are observed.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Compute lime and fertilizer amounts per acre.	I. Soil test results A. N, P, K levels B. Fertilizer formulations 1. Dry 2. Liquid C. Liming 1. Amount 2. Timing 3. pH	I. Realizes that better yields and increased profits results from proper amounts of lime and fertilizer.
II. Calibrate equipment. A. Measure specified length of space. B. Set equipment, apply material, and catch it in containers. C. Weigh materials. D. Calculate rate of application and amount that would be applied per acre.	II. Equipment A. Tractor drawn spreaders B. Bulk trucks C. Hand held cyclone spreaders D. 100 foot tape measure E. Scales	II. Follows safety precautions in handling and and applying lime and fertilizer.
III. Apply lime and fertilizer.		III. Practices calibration of equipment until it can be done efficiently and rapidly.

OUTLINE OF INSTRUCTIONAL CONTENT (CONTINUED)

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
IV. Practices safety principles. A. Read labels. B. Follow label directions. C. Use proper equipment. D. Wear protective clothing.	III. Application of fertilizer and lime A. Equipment calibrated correctly 1. Dry materials a. Pounds/acre b. Placement 2. Liquid materials a. Gallon/acre b. ppm c. Travel rate d. Pump pressure B. Equipment operated efficiently and correctly according to operator's manual. IV. Math A. Algebraic formulas B. Percentages C. Ratios V. Safety A. Reading B. Comprehension	

ANALYSIS

CURRICULUM: Horticulture Technology

SUBJECT AREA: Field Growing of Plants

TASK: (No. G87) Plow, disk, level, and lay off rows for planting.

COMPETENCY: Plow, disk, level, and lay off rows for planting.

CRITERION MEASURE:

1. The prepared seedbed is even and finely textured to a depth of 3-4 inches.
2. The equipment used in seedbed preparation and laying off rows is set up and adjusted correctly according to field conditions.
3. The rows are straight and depth and width of rows are appropriate for the plants.
4. Tractor operation is efficient and handling procedures listed in the operator's manual are followed.
5. All safety precautions in handling and operating equipment are observed.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Set up and adjust equipment.	I. Seedbed preparation A. Equipment (setting up, adjustment, and according to operator's manuals) 1. Tractor 2. Plow 3. Disk 4. Box scraper 5. Scrape blade B. Safety precautions	I. Realizes that a good seedbed and well-prepared rows are required for proper plant growth and good root development.
II. Plow, disk, till, level or otherwise prepare seedbed.	II. Preparing or laying-off rows A. Equipment (setting up, adjustment, and operation according to operator's manuals)	II. Displays safety consciousness.
III. Lay off rows.		III. Practices setting up and adjusting equipment.

OUTLINE OF INSTRUCTIONAL CONTENT (CONTINUED)

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
	1. Tractor 2. Lay-off attachment a. Depth of rows b. Width of rows B. Safety precautions	

ANALYSIS

CURRICULUM: Horticulture Technology **SUBJECT AREA:** Field Growing of Plants

TASK: (No. G88) Lay off and install drainage system if needed.

COMPETENCY: Lay off and install a drainage system in the growing field.

CRITERION MEASURE:

1. The farm level or transit is used correctly to determine slope.
2. The drainage system is laid off for best drainage according to field conditions.
3. Drainage ditches are dug to the proper depth, width, and slope according to field conditions.
4. Hand and motorized equipment is used efficiently and operated according to recommendations found in owners' manuals.

OUTLINE OF INSTRUCTIONAL CONTENT (SEE ATTACHMENT FOR CONCLUSION OF CRITERION MEASURE)

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Use a farm level or transit to determine slope.	I. Laying off drainage system A. Determining slope by using farm level or transit B. Locating ditches or trenches for proper field drainage. C. Determining specifications for type, depth, and slope of drainage line.	I. Realizes that better plant growth is a result of adequate drainage.
II. Lay off drainage system.	II. Methods of digging ditches and operation of tools and equipment A. Mechanical digger B. Backhoe C. Hand digging	II. Attentive to following recommended procedures in installing tile.
III. Dig drainage ditches. A. Operate equipment. B. Dig to proper width, depth, and slope.		III. Displays safety consciousness in operating equipment.
IV. Install drainage tile. A. Put rock or gravel in bottom of ditch. B. Lay tile. C. Cover tile with additional rock or gravel. D. Backfill ditch.		

OUTLINE OF INSTRUCTIONAL CONTENT (CONTINUED)

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
	III. Drainage tile A. Type and size B. Type and size gravel or rock C. Slope or grade D. Depth of gravel bed E. Depth to cover tile with rock or gravel F. Backfilling 1. Backhoe and blade 2. Hand covering	

ATTACHMENT TO TASK #G88

CRITERION MEASURE:
5. Size and type of drainage tile is selected that will do the best job for the situation.
6. Drainage tile is installed following recommended procedures.
7. The tile line has the proper slope or grade.
8. All safety precautions are observed.

ANALYSIS

CURRICULUM: Horticulture Technology

SUBJECT AREA: Field Growing of Plants

TASK: (No. G89) Install and operate irrigation system.

COMPETENCY:
1. Read and interpret blueprints.
2. Install an irrigation system to fit the requirements of the nursery.
3. Operate and maintain it according to manufacturer's recommendations.

CRITERION MEASURE:
1. Blueprints are read and interpreted correctly.
2. An irrigation method is chosen that fits the needs of the nursery or the situation.
3. An adequate water source is used.
4. For a sprinkler system, proper size and type of pipe is selected to adequately feed water to all designated areas.

OUTLINE OF INSTRUCTIONAL CONTENT (SEE ATTACHMENT FOR CONCLUSION OF CRITERION MEASURE)

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Read and interpret blueprints. II. Install irrigation system. A. Select appropriate method depending upon the situation. B. Dig ditches or install pipes, depending on method chosen. C. Select and install pumps. D. Select and install timeclocks. III. Operate the system. A. Turn water on and off manually. B. Set and adjust timeclocks.	I. Blueprints A. Scale B. Dimensional lines C. Specifications II. Irrigation methods A. Surface 1. Flood 2. Furrows or ditches B. Sprinkler C. Subsurface D. Characteristics and advantages and disadvantages of each method E. Determining factors for selection 1. Topography 2. Size of area	I. Recognizes the need to be very selective in choosing an irrigation system. II. Checks carefully to determine when to irrigate and when not to. III. Recognizes that better plant growth and thus increased profits results from correct placement and amounts of water.

OUTLINE OF INSTRUCTIONAL CONTENT (CONTINUED)

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
IV. Maintain the system. A. Check pipes for leaks and repair or replace. B. Clean ditches. C. Lubricate pumps. D. Make minor pump repairs.	3. Cost 4. Labor 5. Water supply 6. Plants' water requirements 7. Type of nursery	IV. Attentive to specifications and recommendations when installing all parts of the system.
	III. Installing the system - procedures A. Tools and equipment use and operation 1. Wrenches 2. Tractor 3. Trenching equipment or backhoe B. Electrical procedures and techniques for timeclocks and possibly small motors and pumps	V. Realizes that without an adequate water source, the system is almost useless.
	IV. Operation and maintenance of the system according to manufacturer's or other recommendations	

ATTACHMENT TO TASK #G89

CRITERION MEASURE:

5. For a sprinkler system, pipes are installed according to manufacturer's recommendations, and risers are located to allow for small overlaps of water.
6. Adequate size pump(s) is selected.
7. Pumps are installed according to manufacturer's recommendations.
8. For surface system, adequate size and depth of trenches are constructed for adequate irrigation.
9. The system or method chosen is operated according to recommendations.
10. The system is maintained according to recommendations.

ANALYSIS

CURRICULUM: Horticulture Technology

SUBJECT AREA: Field Growing of Plants

TASK: (No. G90) Properly plant various species of plants.

COMPETENCY: Install plants in the field by hand or with a transplanter.

CRITERION MEASURE:

1. Holes are spaced at recommended distances depending on the variety and are dug with the correct depth and width depending on the type plant and its size.
2. Plants are placed straight and at the correct depth.
3. Plants are handled carefully in order not to damage them.
4. Holes are backfilled carefully in order not to damage roots, stems, bark, or foliage.
5. A good seedbed is prepared for plants transplanted by machine.
6. Plants are adequately watered.
7. Equipment is operated safely and manufacturer's recommendations followed.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Prepare seedbed. A. Plow. B. Disk. C. Level. D. Rake. II. Transplant plants by mechanical transplanter. III. Dig holes for plants transplanted by hand. A. Hand dig. B. Operate tractor-mounted auger.	I. Handling and operation of tools and equipment A. Tractor B. Tractor-mounted auger C. Mechanical transplanter D. Plow E. Disk F. Tiller G. Hand posthole digger H. Shovels I. Rakes J. Picks K. Mattocks	I. Realizes the properly prepared seedbeds and holes are essential for effective plant growth and development. II. Cooperates with other workers in sharing responsibilities and doing an outstanding job of transplanting. III. Handles and transplants plants carefully in order not to damage them.

OUTLINE OF INSTRUCTIONAL CONTENT (CONTINUED)

SKILL/PROCESS

IV. Plant plants.
   A. Bare-root
      1. Spread roots out.
      2. Place plant in prepared area, with roots evenly spread out.
   B. Container
      1. Remove container.
      2. Place plant erect and at proper depth.

V. Backfill hole.
   A. Amend the backfill.
   B. Move backfill carefully over and around roots or ball of plants.
   C. Pack backfill carefully over and around roots.
   D. Water thoroughly before completing backfilling in order to remove air spaces around roots.
   E. Complete backfilling hole and water thoroughly.

KNOWLEDGE/THEORY

II. Preparing seedbed
   A. Depth
   B. Free of large rocks and debris
   C. Level, without dips or high places

III. Preparing holes
   A. Circumference
   B. Depth
   C. Spacing depending on type and size of plants.

IV. Transplanting plants
   A. Depth
   B. Backfill level
   C. Soil amendments
      1. Vermiculite
      2. Perlite
      3. Peat moss
      4. Sawdust
      5. Etc.
   D. Varieties and size of plants

VALUE/ATTITUDE CONCEPTS

ANALYSIS

CURRICULUM: Horticulture Technology

SUBJECT AREA: Field Growing of Plants

TASK: (No. G91) Cultivate plants.

COMPETENCY: Cultivate plants without covering them up and removing most of the weeds and grass.

CRITERION MEASURE:
1. Plants are cultivated to the proper depth without damaging the roots.
2. Plants are not covered up by cultivation, but soil is placed around the base of plants.
3. Fields are free of weeds and grass.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Cultivate plants. A. Hand B. Tractor	I. Proper use A. Hand tools B. Tractor 1. Controls 2. Safety C. Cultivation 1. Adjustments 2. Depth II. Cultivation procedures	I. Appreciates clean plant beds. II. Recognizes that improved growth of plants is a partial result of less competition from weeds and grass. III. Realizes that improved appearance of plantings results in customers' impression of the business which influences their buying of plants.

ANALYSIS

CURRICULUM: Horticulture Technology **SUBJECT AREA:** Field Growing of Plants

TASK: (No. G92) Develop fertilization program for maintaining plants.

COMPETENCY: Calculate amounts of fertilizer needed according to the way the plants look and are performing and from various test reports.

CRITERION MEASURE:
1. Plants are healthy, have good color and have good growth rates.
2. Schedules for fertilizing various varieties, sizes, and ages of plants are developed.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Take soil test and interpret results.	I. Development of fertilization programs A. Soil test results B. Solubridge results C. Plant color D. Cycle of growth the plant is in at time of fertilization E. Recommended fertilization program from plant researchers F. Growth rates G. Varieties H. Size I. Age	I. Continually keeps a careful watch on plants to see color changes and that plants are healthy and growing well.
II. Take soluble salts test and interpret results.		II. Informs other growers of the fertilization program used.
III. Notice color of plants.		III. Demonstrates a commitment to continually learn as much as possible about fertilization and how it affects plants.
IV. Determine growth rates. A. Measure amount of growth during growing season a minimum of two times. B. Compare growth rates with standard growth rates for the different varieties of plants.		

ANALYSIS

CURRICULUM: Horticulture Technology

SUBJECT AREA: Field Growing of Plants

TASK: (No.G93) Properly fertilize plants.

COMPETENCY: Apply correct amounts of fertilizer by hand and by mechanical application at the best times for optimum plant growth.

CRITERION MEASURE:
1. Fertilizer schedules and rates are determined according to plant requirements.
2. Equipment is correctly calibrated.
3. Type of fertilizer and correct analysis is selected based on plant requirements and soil test results.
4. Fertilizer is applied without damaging the plants.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Determine fertilization schedules and rates of application.	I. Fertilization schedules and application rates A. Plant requirements B. Type of fertilizer C. Rate of growth desired	I. Realizes that improper fertilization will damage plants.
II. Select type of fertilizer and correct analysis.	II. Choice of fertilizer A. Minerals needed B. Application method C. Other fertilizer effects D. Relative costs E. Plant requirements	II. Recognizes that better plants and increased profits result from a good fertilization program.
III. Calibrate equipment.	III. Calibration of equipment for mechanical application	III. Practices calibration of equipment until it can be done efficiently and rapidly.

OUTLINE OF INSTRUCTIONAL CONTENT (CONTINUED)

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
IV. Apply fertilizer.	IV. Application procedures	
A. Hand application	A. Dry	
B. Mechanical	1. Granules	
	2. Slow-release	
	3. Tablets	
	B. Liquid	
	1. Pump	
	2. Injector	

ANALYSIS

CURRICULUM: Horticulture Technology **SUBJECT AREA:** Field Growing of Plants

TASK: (No. G94) Prune plants at proper time using appropriate methods.

COMPETENCY: Prune plants at proper time using appropriate methods and tools.

CRITERION MEASURE:

1. Correct times are identified for pruning various species of plants.
2. The proper pruning method is selected for the condition and type of plant.
3. Correct pruning procedures are followed for the selective and heading back pruning methods.
4. Reasons for pruning are correctly identified.
5. Appropriate tools are selected for the type of pruning to be done.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Select equipment. II. Prune plants.	I. Pruning equipment (characteristics and uses) A. Hand shears B. Loppers C. Saws D. Axes E. Knives II. Timing A. Herbaceous plants B. Woody plants 1. Deciduous 2. Evergreen C. Factors 1. Food supply 2. Flowering period 3. Plant hardiness	I. Realizes that customers value well-pruned, healthy plants. II. Follows recommended pruning procedures. III. Voluntarily practices pruning procedures.

Outline of Instructional Content (Continued)

Skill/Process	Knowledge/Theory	Value/Attitude Concepts
	4. Plant dormancy 5. Labor availability III. Methods of pruning - characteristics and methodology IV. Objectives or reasons for pruning A. Preserve plant health B. Remove broken and dead limbs C. Emphasize growth habit D. Sculpture plants E. Reduce danger on large plants and trees F. Restrict plant growth G. Encourage flowering H. Repair damaged or diseased plants	

ANALYSIS

CURRICULUM: Horticulture Technology

SUBJECT AREA: Field Growing of Plants

TASK: (No. G95) Identify weeds, pests, and diseases.

COMPETENCY:
1. Identify weeds, pests, and diseases by common name visually or by using reference material.
2. Spell common names of weeds, pests, and diseases.

CRITERION MEASURE:
1. Selected weeds, pests, and diseases are correctly identified by common name visually or by using reference material.
2. Common names of weeds, pests, and diseases are spelled correctly.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Identify weeds, pests, and diseases visually. II. Identify weeds, pests, and diseases by using resource materials. III. Spell common names of weeds, pests, and diseases.	I. Identification of weeds, pests, and diseases in annuals, biennials, and perennials A. Visually 1. Physical appearance 2. Life cycle B. Using resource materials 1. Keys 2. Books 3. Trade magazines 4. Horticulture specialists 5. Trade catalogs 6. Scientific publications	I. Enjoys identifying weeds, pests, and diseases. II. Realizes that proper identification is essential in selection of controls. III. Attentive to identifiable details of weeds, pests, and diseases.

OUTLINE OF INSTRUCTIONAL CONTENT (CONTINUED)

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
	II. Spelling techniques A. Memorization B. Association C. Spelling rules D. Latin usage	

ANALYSIS

CURRICULUM: Horticulture Technology **SUBJECT AREA:** Field Growing of Plants

TASK: (No. G96) Remove dead or undesirable stock.

COMPETENCY: Identify, remove, and destroy dead, diseased, and other undesirable stock.

CRITERION MEASURE:
1. Dead, diseased, or other undesirable stock are correctly identified visually and by using resource materials.
2. Dead, diseased, or other undesirable stock are properly removed and destroyed.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Identify dead, diseased, or other undesirable stock.	I. Identification A. Symptoms 1. Brittle 2. Dead foliage 3. Growth irregularities 4. Discoloration 5. Dropping of foliage 6. Adhesions 7. Other B. Resource materials 1. Books 2. Keys 3. Horticulture specialists 4. Scientific journals 5. Trade magazines and journals	I. Realizes that removal of diseased or other undesirable stock is necessary to prevent contamination of the whole nursery.
II. Remove and destroy dead, diseased, or other undesirable stock.		II. Follows recommended procedures carefully in destroying undesirable stock.

OUTLINE OF INSTRUCTIONAL CONTENT (CONTINUED)

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
	6. Research laboratories 7. Other II. Removal procedures III. Eradication procedures A. Burying B. Burning C. Other	

ANALYSIS

CURRICULUM: Horticulture Technology

SUBJECT AREA: Field Growing of Plants

TASK: (No. G97) Determine methods of control needed to eradicate weeds, pests, and diseases.

COMPETENCY: List control methods for weeds, pests, and diseases from memory or by using reference material.

CRITERION MEASURE: Control methods for weeds, pests, and diseases are correctly provided by recall or by using reference material.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Identify control methods by recall. II. Determine control methods by using resource materials.	I. Control methods for weeds A. Mechanical B. Chemicals 1. Postemergence 2. Preemergence C. Hand removal II. Control methods for pests A. Mechanical B. Biological C. Cultural D. Chemicals 1. Contact 2. Systemic	I. Realizes that control of weeds, pests, and diseases results in better plant growth and a more saleable plant.

OUTLINE OF INSTRUCTIONAL CONTENT (CONTINUED)

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
	III. Control methods for diseases A. Chemicals B. Sanitation	
	IV. Resource materials A. Plant keys B. Books C. Trade magazines D. People E. Trade catalogs F. Scientific publications	

ANALYSIS

CURRICULUM: Horticulture Technology

SUBJECT AREA: Field Growing of Plants

TASK: (No. G98) Apply appropriate control measures.

COMPETENCY: Apply control measures on weeds, pests, and diseases using chemicals and other measures where appropriate. Calibrate equipment.

CRITERION MEASURE:

1. Chemical control measures are applied correctly following label instructions.
2. Sprayers, dusters, and foggers are operated according to manufacturer's recommendations and calibrated correctly.
3. Biological, cultural, sanitation, and chemical control measures are used where appropriate and recommended procedures followed.
4. All safety precautions are observed.
5. Equipment is thoroughly cleaned after each use, removing all residues.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Read and follow labels for chemical control measures. II. Set up, adjust, and operate sprayers, dusters, and foggers. III. Calibrate equipment.	I. Chemical labels A. Directions B. Precautions C. Controls D. Effective dates of use E. Other information	I. Complies with warnings and other instructions on all labels. II. Displays safety consciousness in handling and using chemicals.
IV. Implement biological, cultural, sanitation, and chemical control measures where applicable.	II. Setting up, adjusting, calibrating, and operating equipment A. Sprayers B. Dusters C. Foggers	III. Only uses control measures when necessary.
V. Clean equipment after use. A. Wash equipment thoroughly with soap and water. B. Run water through nozzles.	III. Control measures and recommended procedures A. Biological B. Cultural	

OUTLINE OF INSTRUCTIONAL CONTENT (CONTINUED)

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
C. Dry excess water with clean cloth and allow to dry thoroughly.	C. Chemical 1. Mechanical application 2. Hand application D. Sanitation	

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ANALYSIS

CURRICULUM: Horticulture Technology **SUBJECT AREA:** Field Growing of Plants

TASK: (No. G99) Know factors affecting control measures (wind, rain, temperature, etc.).

COMPETENCY: Describe how wind, rain, temperature, humidity, and soil conditions affect control measures on weeds, pests, and diseases.

CRITERION MEASURE: Control measures affected by environmental factors are described correctly by recall.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Describe how various factors affect control measures. A. Wind B. Rain C. Temperature D. Humidity E. Soil moisture and temperature	I. Environmental conditions affecting control measures A. Drift of chemicals as affected by rain and wind B. Concentration of chemicals on leaves as affected by rain C. Absorption and effectiveness of chemicals as related to temperature D. Damage to leaf surface by chemicals related to high temperature and humidity E. Leaching and absorption of chemicals as related to soil moisture	I. Adapts application techniques to existing environmental conditions. II. Delays application of chemicals when environmental conditions are not suitable.

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OUTLINE OF INSTRUCTIONAL CONTENT (CONTINUED)

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
	F. Effectiveness of chemicals as related to soil temperature and moisture G. Evaporation of chemicals as affected by wind, temperature, humidity, etc.	

ANALYSIS

CURRICULUM: Horticulture Technology

SUBJECT AREA: Field Growing of Plants

TASK: (No. G100) Follow all safety factors when administering control measures.

COMPETENCY: Describe and follow the safety factors involved in using equipment and administering control measures on weeds, pests, and diseases.

CRITERION MEASURE:

1. Safety regulations and precautions described on labels are followed.
2. Safety factors in setting up, adjusting, and operating equipment are described and followed.
3. Recommended safety factors are followed when control measures are being implemented.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Read and follow safety regulations and precautions described on labels.	I. Labels A. Precautions B. Warnings C. Effective dates of use	I. Realizes that following safety precautions reduces the chance of injury to self and others.
II. Set up, adjust, and operate equipment in safe manner. A. Sprayers B. Dusters C. Foggers D. Traps	II. Recommended safety warnings and precautions are observed in setting up, adjusting, and operating equipment	II. Attentive to safety warnings and precautions on labels.
III. Administer control measures safely. A. Wear protective clothing. B. Measure concentrates and powders carefully.	III. Safety precautions and procedures when implementing control measures	III. Follows directions on labels explicitly on amounts of materials to use.

OUTLINE OF INSTRUCTIONAL CONTENT (CONTINUED)

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
C. Mix ingredients carefully without spilling. D. Keep spray materials off skin. E. Avoid spraying on windy days.		IV. Avoids getting chemicals on self or others.

ANALYSIS

CURRICULUM: Horticulture Technology

SUBJECT AREA: Field Growing of Plants

TASK: (No. G101) Dig plants properly (machine or by hand).

COMPETENCY: Dig established plants by hand or mechanically.

CRITERION MEASURE:

1. Plants are dug without damaging the roots, bark, stem, branches, or foliage.
2. Ball and burlap plants are dug with a firm ball, burlap pinned tightly and tied with cord if needed.
3. Equipment used in digging plants mechanically is operated according to manufacturer's recommendations, and recommended procedures in digging plants are followed.
4. Shovels, spades, and other hand equipment is properly used.
5. Safety precautions are observed.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Dig plants. A. Bare-root B. Ball and burlap C. Machine ball	I. Use of tools and equipment A. Shovels B. Digging machines (tractor mounted or self-contained units)	I. Aware that properly dug and prepared plants have a better chance of living and growing properly.
	II. Procedures for digging plants	II. Accepts responsibility for damaged plants.
	III. Safety precautions and regulations	III. Adheres to safety practices.

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CURRICULUM: Horticulture Technology

SUBJECT AREA: Container Growing of Plants

TASK: (No. H102) Select proper media and prepare media according to soil tests.

COMPETENCY:

1. Select a media suitable for plant growth according to requirements of the type of plant and results of soil test.
2. Mix the media by hand or mechanically.

CRITERION MEASURE:

1. The media selected is correct for the different varieties of plants grown, resulting in good plant growth.
2. Soil test results are interpreted correctly.
3. Soil and soil conditioners are uniformly mixed.
4. Soil mixture is free of lumps, individual ingredients, foreign material or weed seed.
5. Mechanical mixers are operated according to recommended procedures.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Take soil test.	I. Procedures for taking soil test	I. Realizes that good plant growth results from good media.
II. Read and interpret soil test results.	II. Reading and interpreting soil test results	II. Realizes that a well mixed media is necessary for good plant growth.
III. Select media for each type of plant grown.	III. Media components (charactertics and advantages of each) A. Solid materials 1. Organic a. Bark b. Peat c. Manure d. Humus e. Hulls f. Perlite g. Vermiculite h. Other	
IV. Mix media.		

Outline of Instructional Content (Continued)

Skill/Process	Knowledge/Theory	Value/Attitude Concepts
	2. Inorganic a. Sand b. Slate c. Soil d. Chemical amendments B. Pore space 1. % water 2. % air IV. Mixing procedures A. Hand tools B. Rotary tiller C. Motorized mixer D. Tractor loader	

ANALYSIS

CURRICULUM: Horticulture Technology

SUBJECT AREA: Container Growing of Plants

TASK: (No. H103) Select proper sized container.

COMPETENCY: Select appropriate sized containers for each variety of plant grown.

CRITERION MEASURE:

1. Containers are selected that provide good root development for plants and allow for good plant growth.
2. Containers selected are durable and are moderate in cost.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Select container size appropriate for the plant size and variety.	I. Types of containers (characteristics and advantages of each) A. Metal pointed B. Salvaged cans C. Plastic D. Paper mache E. Pressed peat F. Other II. Selection factors A. Cost B. Durability C. Growth habits of selected plants	I. Satisfaction of growing a plant in a good looking, economical containers and with the least number of repottings.

ANALYSIS

CURRICULUM: Horticulture Technology

SUBJECT AREA: Container Growing of Plants

TASK: (No. H104) Sterilize media.

COMPETENCY: Sterilize soil mixtures using chemicals and steam.

CRITERION MEASURE:

1. Soil media is sterilized correctly resulting in no weed growth and no root diseases.
2. The sterilization method is selected that is most appropriate to the situation.
3. Recommended procedures for the different methods are followed.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Select method that best fits the situation. II. Sterilize media.	I. Sterilization selection factors A. Cost B. Size of operation C. Type of equipment and facilities II. Methods and procedures of sterilizing media A. Chemicals 1. Types a. Formaldehyde drench b. Tear gas c. Methyl bromide d. DD e. Vapam f. Chloropicrin 2. Equipment (use and operation)	I. Realizes that there will be less disease and weed problems with good sterilization techniques. II. Carefully implements sterilization procedures for effective results.

OUTLINE OF INSTRUCTIONAL CONTENT (CONTINUED)

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
	B. Steam 1. Time 2. Temperature 3. Equipment (use and operation)	

ANALYSIS

CURRICULUM: Horticulture Technology

SUBJECT AREA: Container Growing of Plants

TASK: (No. H105) Pot and repot plants properly.

COMPETENCY: Pot and repot plants according to established procedures.

CRITERION MEASURE:

1. Plants are potted at the correct depth with the top of the plant perpendicular to the soil surface so that the plants grow straight.
2. Plants are repotted when the pot is too small for the plant.
3. Plants are adequately watered after potting.
4. Plants are removed from pots without injuring them.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Pot plants. A. Put small amount of soil mixture into pot. B. Set plant in pot at correct depth. C. Add more mixture and pack it firmly around the roots and stem of the plant. D. Water immediately after potting.	I. Potting plants procedures A. Depth (to original soil level) B. Soil in container should be ½" below top of container for watering	I. Realizes that a properly potted plant will grow faster and be healthier than those that are not properly potted.
II. Repot plants. A. Loosen soil from edges of pot. B. Remove plant from pot. C. Place plant into another pot and repeat steps in I.	II. Repotting plants procedures A. Care in handling soil ball B. Depth (to original level) C. Soil mix conducive to plant growth	II. Exercises care in handling plants in order not to injure them.

ANALYSIS

CURRICULUM: Horticulture Technology

SUBJECT AREA: Container Growing of Plants

TASK: (No. H106) Prepare the beds including drainage system.

COMPETENCY: Prepare the growing bed for placing container stock including drainage system.

CRITERION MEASURE:

1. The prepared beds are level, easily accessible and have good drainage.
2. Equipment used to prepare the beds is handled efficiently and safely.
3. The size of the beds are within recommended dimensions.
4. Beds are located apart for ease of travel between them with truck or tractor.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Lay off beds.	I. Laying off beds (procedures) A. Dimensions B. Distance between beds	I. Desires to have a neat and attractive looking container area.
II. Prepare beds.	II. Preparing beds (procedures)	II. Realizes that good drainage in a bed improves plant growth.
		III. Realizes that a neat and organized bed looks good and helps sell plants.

ANALYSIS

CURRICULUM: Horticulture Technology

SUBJECT AREA: Container Growing of Plants

TASK: (No. H107) Space containers in bed.

COMPETENCY: Space plants in prepared beds according to the variety and needs of the plant.

CRITERION MEASURE:
1. Plants are spaced in beds for good access and room for growth.
2. Plants are placed in beds quickly, in straight lines, and without injuring them.

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OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Space plants in beds.	I. Requirements of spacing A. Variety of plant B. Habit of growth C. Amount of growth in one growing season D. Type of irrigation system II. Procedures for placing containers of plants in beds	I. Aware of the importance of properly placing plants in beds.

ANALYSIS

CURRICULUM: Horticulture Technology

SUBJECT AREA: Container Growing of Plants

TASK: (No. H108) Set up and maintain irrigation system.

COMPETENCY:
1. Read and interpret blueprints.
2. Install an irrigation system to fit the requirements of the nursery and maintain the system according to manufacturer's recommendations.

CRITERION MEASURE:
1. Blueprints are read and interpreted correctly.
2. An irrigation system is chosen that fits the needs of the nursery or the situation.
3. An adequate water source is located and used efficiently.
4. For a sprinkler system, proper size and type of pipe is selected to adequately feed water to all designated areas.
5. For a sprinkler system, pipes are installed according to recommendations, and risers are located to allow for small overlaps of water.

OUTLINE OF INSTRUCTIONAL CONTENT (SEE ATTACHMENT FOR CONCLUSION OF CRITERION MEASURE)

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Read and interpret blueprints.	I. Blueprints A. Scale B. Dimensional lines C. Specifications	I. Recognizes the need to be very selective in choosing an irrigation system.
II. Install irrigation system. A. Select appropriate method depending upon the situation. B. Dig ditches or install pipes, depending on method chosen. C. Select and install pumps. D. Select and install time-clocks.	II. Irrigation methods A. Surface 1. Flood 2. Furrows or ditches B. Sprinkler C. Characteristics of methods D. Advantages and disadvantages E. Determining factors for selection 1. Topography 2. Size of area 3. Cost 4. Labor	II. Recognizes that better plant growth and thus increased profits results from correct placement and amounts of water.
III. Maintain the system. A. Check pipes for leaks and repair or replace. B. Clean ditches or trenches. C. Lubricate pumps. D. Make minor pump repairs.		III. Attentive to specifications and recommendations when installing all parts of the system.

OUTLINE OF INSTRUCTIONAL CONTENT (CONTINUED)

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
	5. Water supply 6. Plant requirements 7. Type of nursery 8. Other	IV. Attentive to making periodic maintenance checks of the system.
	III. Installation tools and equipment, their use and operation A. Wrenches B. Tractor C. Trenching equipment or backhoe D. Electrical procedures and techniques for timeclocks and possibly motors and pumps	
	IV. Maintenance of the system according to manufacturer's recommendations	

ATTACHMENT TO TASK #H108

CRITERION MEASURE:

6. Adequate size pump(s) is selected.
7. Pumps are installed according to manufacturer's recommendations.
8. For surface system, adequate size and depth of trenches are constructed for adequate irrigation.
9. The system is maintained according to recommendations.

Appendix

ANALYSIS

CURRICULUM: Horticulture Technology

SUBJECT AREA: Container Growing of Plants

TASK: (No.H109) Operate irrigation system.

COMPETENCY: Operate different irrigation systems.

CRITERION MEASURE:

1. Irrigation systems are operated according to recommendations.
2. Plants are irrigated only when necessary.
3. Amount of water used is measured and water is cut off when adequate amount applied.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Operate irrigation systems. A. Turn water on and off manually. B. Set and adjust timeclocks. C. Open valves for trench system. D. Check pumps periodically for proper operation. E. Move pipes and risers as needed. F. Irrigate plants when needed.	I. Operating procedures for different irrigation systems A. Pumps B. Timeclocks C. Pipes D. Risers E. Valves F. Other	I. Attentive to specifications for operating irrigation systems.
	II. Determination of when to irrigate.	II. Makes careful analysis of when to irrigate, when not to, and how much water to apply.
	III. Measuring amount of water applied	
	IV. Determination of amount of water to use on different type plants	

ANALYSIS

CURRICULUM: Horticulture Technology

SUBJECT AREA: Container Growing of Plants

TASK: (No. H110) Mulch plants properly for winter protection.

COMPETENCY: Mulch plants for winter protecting using appropriate types of mulch.

CRITERION MEASURE:
1. Plants are mulched with appropriate material without damaging stems or foliage.
2. Plants are mulched with recommended amounts of materials over and around plants.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Select mulch.	I. Types of mulch (characteristics and advantages) A. Plastic B. Sawdust C. Shavings D. Bark 1. Pine 2. Hardwood	I. Realizes that plants require less water, have less soil temperature variation, fewer weeds, and have less winter damage with a good mulch.
II. Mulch plants.	II. Factors in mulching plants A. Cost B. Amount of materials required C. Availability of materials D. Time to mulch E. Method 1. Hand 2. Machine	

OUTLINE OF INSTRUCTIONAL CONTENT (CONTINUED)

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
	III. Procedures for mulching container plants	

ANALYSIS

CURRICULUM: Horticulture Technology

SUBJECT AREA: Container Growing of Plants

TASK: (No.H111) Prune plants at proper time using appropriate methods.

COMPETENCY: Prune plants at proper time using appropriate methods and tools.

CRITERION MEASURE:

1. Correct times are identified for pruning various species of plants.
2. The proper pruning method is selected for the condition and type of plant.
3. Correct pruning procedures are followed for the selective and heading back pruning methods.
4. Reasons for pruning are correctly identified.
5. Appropriate tools are selected for the type of pruning to be done.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Select equipment.	I. Pruning equipment (characteristics and uses) A. Hand shears B. Loppers C. Saws D. Axes E. Knives	I. Realizes that customers value well-pruned, healthy plants.
II. Prune plants.	II. Timing A. Herbaceous plants B. Woody plants 1. Deciduous 2. Evergreen C. Factors 1. Food supply 2. Flowering period 3. Plant hardiness 4. Plant dormancy	II. Follows recommended pruning procedures.
		III. Voluntarily practices pruning procedures.

OUTLINE OF INSTRUCTIONAL CONTENT (CONTINUED)

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
	5. Labor availability	
	III. Methods of pruning (characteristics and methodology)	
	IV. Objectives or reasons for pruning A. Preserve plant health B. Remove broken and dead limbs C. Emphasize growth habit D. Sculpture plants E. Reduce danger on large plants and trees F. Restrict plant growth G. Encourage flowering H. Repair damaged or diseased plants	

ANALYSIS

CURRICULUM: Horticulture Technology

SUBJECT AREA: Container Growing of Plants

TASK: (No. H112) Identify weeds, pests, and diseases.

COMPETENCY:
1. Identify weeds, pests, and diseases by common name visually or by using reference material.
2. Spell common names of weeds, pests, and diseases.

CRITERION MEASURE:
1. Selected weeds, pests, and diseases are correctly identified by common name visually or by using reference material.
2. Common names of weeds, pests, and diseases are spelled correctly.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Identify weeds, pests, and diseases visually.	I. Identification of weeds, pests, and diseases (annuals, biennials, perennials) A. Visually 1. Physical appearance 2. Life cycle B. Using resource materials 1. Keys 2. Books 3. Trade magazines 4. Horticulture specialists 5. Trade catalogs 6. Scientific publications	I. Enjoys identifying weeds, pests, and diseases.
II. Identify weeds, pests, and diseases by using resource materials.	II. Spelling techniques A. Memorization B. Association	II. Realizes that proper identification is essential in selection of controls.
III. Spell common names of weeds, pests, and diseases.		III. Attentive to identifiable details of weeds, pests, and diseases.

OUTLINE OF INSTRUCTIONAL CONTENT (CONTINUED)

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
	C. Spelling rules D. Latin usage	

ANALYSIS

CURRICULUM: Horticulture Technology

SUBJECT AREA: Container Growing of Plants

TASK: (No. H113) Remove dead or undesirable stock.

COMPETENCY: Identify, remove, and destroy dead, diseased, and other undesirable stock.

CRITERION MEASURE:
1. Dead, diseased, or other undesirable stock are correctly identified visually and by using resource materials.
2. Dead, diseased, or other undesirable stock are properly removed and destroyed.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Identify, dead, diseased, or other undesirable stock. II. Remove and destroy dead, diseased, or other undesirable stock.	I. Identification A. Symptoms 1. Brittle 2. Dead foliage 3. Growth irregularities 4. Discoloration 5. Dropping of foliage 6. Adhesions 7. Other B. Resource materials 1. Books 2. Keys 3. Horticulture specialists 4. Scientific journals 5. Trade magazines and journals	

OUTLINE OF INSTRUCTIONAL CONTENT (CONTINUED)

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
	6. Research laboratories 7. Other II. Removal procedures III. Eradication procedures A. Burying B. Burning C. Other	

ANALYSIS

CURRICULUM: Horticulture Technology

SUBJECT AREA: Container Growing of Plants

TASK: (No. H114) Determine methods of control needed to eradicate weeds, pests, and diseases.

COMPETENCY: List control methods for weeds, pests, and diseases from memory or by using reference material.

CRITERION MEASURE: Control methods for weeds, pests, and diseases are correctly provided by recall or by using reference material.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Identify control methods by recall. II. Determine control methods by using resource materials.	I. Control methods for weeds A. Mechanical B. Chemicals 1. Postemergence 2. Preemergence C. Hand removal II. Control methods for pests A. Mechanical B. Biological C. Cultural D. Chemicals 1. Contact 2. Systemic III. Control methods for diseases A. Chemicals B. Sanitation	I. Realizes that control of weeds, pests, and diseases results in better plant growth and a more saleable plant.

OUTLINE OF INSTRUCTIONAL CONTENT (CONTINUED)

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
	IV. Resource materials A. Plant keys B. Books C. Trade magazines D. People E. Trade catalogs F. Scientific publications	

ANALYSIS

CURRICULUM: Horticulture Technology

SUBJECT AREA: Container Growing of Plants

TASK: (No. H115) Apply appropriate control measures.

COMPETENCY: Apply control measures on weeds, pests, and diseases using chemicals and other measures where appropriate. Calibrate equipment.

CRITERION MEASURE:

1. Chemical control measures are applied correctly following label instructions.
2. Sprayers, dusters, and foggers are operated according to manufacturer's recommendations and calibrated correctly.
3. Biological, cultural, sanitation, and chemical control measures are used where appropriate and recommended procedures followed.
4. All safety precautions are observed.
5. Equipment is thoroughly cleaned after each use, removing all residues.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Read and follow labels for chemical control measures.	I. Chemical labels A. Directions B. Precautions C. Controls D. Effective dates of use E. Other information	I. Complies with warnings and other instructions on all labels.
II. Set up, adjust, and operate sprayers, dusters, and foggers.	II. Setting up, adjusting, calibration, and operating equipment A. Sprayers B. Dusters C. Foggers	II. Displays safety consciousness in handling and using chemicals.
III. Calibrate equipment.	III. Control measures (recommended procedures) A. Biological B. Cultural	III. Only uses control measures when necessary.
IV. Implement biological, cultural, sanitation, and chemical control measures where applicable.		
V. Clean equipment after use. A. Wash equipment thoroughly with soap and water. B. Run water through nozzles.		

OUTLINE OF INSTRUCTIONAL CONTENT (CONTINUED)

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
C. Dry excess water with clean cloth and allow to dry thoroughly.	C. Chemical 1. Mechanical application 2. Hand application D. Sanitation	

ANALYSIS

CURRICULUM: Horticulture Technology

SUBJECT AREA: Container Growing of Plants

TASK: (No. H116) Know factors affecting control measures (wind, rain, temperature, etc.).

COMPETENCY: Describe how wind, rain, temperature, humidity, and soil conditions affect control measures on weeds, pests, and diseases.

CRITERION MEASURE: Control measures affected by environmental factors are described correctly by recall.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Describe how various factors affect control measures. A. Wind B. Rain C. Temperature D. Humidity E. Soil moisture and temperature	I. Environmental conditions affecting control measures A. Drift of chemicals as affected by rain and wind B. Concentration of chemicals on leaves as affected by rain C. Absorption and effectiveness of chemiclas as related to temperature D. Damage to leaf surface by chemicals related to high temperature and humidity E. Leaching and absorption of chemicals as related to soil moisture	I. Adapts application technqiues to existing environmental conditions. II. Delays application of chemicals when environmental conditions are not suitable.

OUTLINE OF INSTRUCTIONAL CONTENT (CONTINUED)

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
	F. Effectiveness of chemicals as related to soil temperature and moisture G. Evaporation of chemicals as affected by wind, temperature, humidity, etc.	

ANALYSIS

CURRICULUM: Horticulture Technology

SUBJECT AREA: Container Growing of Plants

TASK: (No.H117) Follow all safety factors when administering control measures.

COMPETENCY: Describe and follow the safety factors involved in using equipment and administering control measures on weeds, pests, and diseases.

CRITERION MEASURE:

1. Safety regulations and precautions described on labels are followed.
2. Safety factors in setting up, adjusting, and operating equipment are described and followed.
3. Recommended safety factors are followed when control measures are being implemented.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Read and follow safety regulations and precautions described on labels.	I. Labels A. Precautions B. Warnings C. Effective dates of use	I. Realizes that following safety precautions reduces the chance of injury to self and others.
II. Set up, adjust, and operate equipment in safe manner. A. Sprayers B. Dusters C. Foggers D. Traps	II. Recommended safety warnings and precautions are observed in setting up, adjusting, and operating equipment	II. Attentive to safety warnings and precautions on labels.
III. Administer control measures safely. A. Wear protective clothing. B. Measure concentrates and powders carefully. C. Mix ingredients carefully without spilling.	III. Safety precautions and procedures when implementing control measures	III. Follows directions on labels explicitly on amounts of materials to use.
		IV. Avoids getting chemicals on self or others.

OUTLINE OF INSTRUCTIONAL CONTENT (CONTINUED)

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
D. Keep spray materials off skin. E. Avoid spraying on windy days.		

ANALYSIS

CURRICULUM: Horticulture Technology

SUBJECT AREA: Building and Equipment Maintenance

TASK: (No. 1118) Keep storage, delivery area, display area, nursery, greenhouse, salesroom, and other facilities neat and clean.

COMPETENCY: Keep storage, delivery area, display area, nursery, greenhouse, salesroom, and other facilities neat and clean.

CRITERION MEASURE: All facilities are kept free of dirt and trash with materials and plants well organized for easy access and pleasant working conditions.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Clean facilities to remove dirt and trash.	I. Cleaning A. Techniques 1. Sweeping 2. Dusting 3. Mopping 4. Vacuuming 5. Washing B. Cleansing agents C. Equipment 1. Mops 2. Brooms 3. Pails 4. Vacuum cleaners II. Organizing plants and materials A. Keep like plants and materials together	I. Demonstrates the characteristics of neatness, cleanliness, and orderliness. II. Realizes that customers are more attracted to neat and clean facilities. III. Works well with others in keeping facilities neat and clean. IV. Enjoys working and takes pride in neat and clean facilities.

OUTLINE OF INSTRUCTIONAL CONTENT (CONTINUED)

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
	B. Labeling C. Arranging plants and materials in neat stacks, piles, rows, etc.	

ANALYSIS

CURRICULUM: Horticulture Technology

SUBJECT AREA: Building and Equipment Maintenance

TASK: (No. I119) Clean and sharpen hand tools.

COMPETENCY: Clean and sharpen hand tools using cleansing agents, hand files, and emory wheels.

CRITERION MEASURE: Hand tools are properly cleaned and sharpened, with cutting edges beveled to the correct angles.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Clean hand tools.	I. Cleaning A. Agents B. Mixing C. Procedure D. Safety E. Storage	I. Realizes that sharp, clean tools increase work efficiency and makes tasks easier. II. Demonstrates self-reliance in cleaning and sharpening tools after use.
II. Sharpen hand tools.	II. Sharpening A. Equipment 1. Sharpening stone 2. Files 3. Lubricants 4. Emory wheels B. Procedures C. Safety D. Storage	III. Follows safety precautions when sharpening tools.

ANALYSIS

CURRICULUM: Horticulture Technology **SUBJECT AREA:** Building and Equipment Maintenance

TASK: (No. I120) Develop light maintenance schedule for business vehicles, tractors, lifts, and other equipment (oil, lubrication, tire pressure, battery, brake fluid, radiator, etc.).

COMPETENCY: Develop light maintenance schedule for business vehicles, tractors, lifts, and other equipment; also oil, lubricate, check tire pressure, battery, brake fluid, radiator, etc.

CRITERION MEASURE:
1. A routine light maintenance program check is developed for business vehicles and equipment in accordance with manufacturer's recommendations.
2. Vehicles and equipment are properly lubricated.
3. Fluid levels, pressures, and tensions are properly adjusted and maintained.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Develop maintenance schedules. II. Lubricate vehicles. III. Adjust and maintain fluid levels. IV. Adjust and maintain pressures. V. Adjust and maintain tensions.	I. Maintenance schedule A. Mileage B. Hours C. Use II. Owner's manual (recommendations and procedures) A. Lubrication procedures B. Fluid levels 1. Engine oil 2. Battery 3. Coolant 4. Brakes 5. Power steering 6. Transmission 7. Air conditioning 8. Radiator	I. Recognizes that preventative maintenance is necessary for eliminating many equipment problems and failures. II. Demonstrates a commitment to setting up and following maintenance schedules.

OUTLINE OF INSTRUCTIONAL CONTENT (CONTINUED)

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
	C. Pressures 1. Tire 2. Oil D. Tensions 1. Belts 2. Pulleys 3. Fly wheels E. Supplies (i.e. oil, grease, fluids, etc.)	

ANALYSIS

CURRICULUM: Horticulture Technology

SUBJECT AREA: Building and Equipment Maintenance

TASK: (No. 1121) Tune up business vehicles, tractors, lifts, and other equipment as needed.

COMPETENCY: Determine when to tune up vehicles; replace and gap spark plugs; replace and gap points; replace condensors; set timing; replace PCV valves and air filters.

CRITERION MEASURE:

1. Determination of when to tune up vehicles is made when operation of vehicles become inefficient.
2. Spark plugs are removed, new plugs selected, gaped, and installed properly.
3. Points are removed and new ones are selected, gaped, and installed properly.
4. Condensors are removed and new ones are selected and installed properly.
5. Timing is set according to manufacturer's recommendations.
6. PCV valves are removed and new ones are selected and installed properly.
7. Air filters are removed and new ones are selected and installed properly.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Determine when to tune up vehicles and equipment. A. Listen for spark-knocks. B. Check points, plugs, and timing periodically. C. Listen and be alert for engine skipping. D. Check gas useage periodically.	I. Information A. Owner's manual B. Manufacturer's information C. Repair manuals	I. Appreciates the importance of "well-tuned" operational vehicles and equipment.
II. Remove spark plugs, select new ones, gap, and install new plugs.	II. Basic principles A. Gasoline engines B. Diesel engines	II. Alert to the need for tuning up vehicles and equipment.
III. Remove points, select new ones, gap, and install new points.	III. Replacement parts, types, sizes, removal, and installation procedures A. Spark plugs B. Points C. Condensors D. PCV valves E. Air filters	III. Attends to the manufacturer's recommendations when gaping spark plugs and points and setting timing.

OUTLINE OF INSTRUCTIONAL CONTENT (CONTINUED)

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
IV. Remove condensors, select new ones and install new condensors.	IV. Procedures for timing vehicles and equipment.	
V. Set timing.		
VI. Remove PCV valves, select new ones and install new PCV valves.		
VII. Remove air filters, select new ones and install new air filters.		

ANALYSIS

CURRICULUM: Horticulture Technology

SUBJECT AREA: Building Equipment Maintenance

TASK: (No. I122) Repair display cases, storage shelves, slathouses, greenhouses, storage buildings, etc.

COMPETENCY: Repair display cases, storage shelves, slathouses, greenhouses, storage buildings, etc. using basic carpentry skills.

CRITERION MEASURE:

1. Repair needs are identified.
2. Appropriate materials, tools, and equipment are selected for use in repairing facilities.
3. Repairs are properly performed with tools and equipment that are used correctly and efficiently.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Identify repair needs.	I. Repair identification A. Periodic inspection B. Observation	I. Alert to needed repairs.
II. Select materials, tools, and equipment needed for repairs.	II. Repair information A. Owner's manual B. Manufacturer's information C. Repair manuals D. Books E. Pamphlets F. Short courses, seminars	II. Keeps updated on repairing greenhouses and other facilities by reading repair manuals, manufacturer's recommendations, etc.
III. Perform repairs using tools and equipment correctly and efficiently. A. Tools and equipment 1. Saws 2. Hammers 3. Putty knives 4. Weatherstripping 5. Other B. Repairs 1. Recover greenhouses. 2. Replace window glass.	III. Basic repairs (procedures and techniques) A. Materials B. Tools C. Equipment	III. Recognizes that repairs save fuel and other costs and help maintain attractive facilities.
		IV. Identifies repair needs by periodic inspection and completes repairs promptly.

OUTLINE OF INSTRUCTIONAL CONTENT (CONTINUED)

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
3. Replace snow fencing on slathouses. 4. Replace shelves. 5. Replace roof on storage shed. 6. Reside buildings. 7. Other		

ANALYSIS

Curriculum: Horticulture Technology

Subject Area: Building and Equipment Maintenance

Task: (No. I123) Maintain and repair small gas engines, dusters, sprayers, climbing equipment, etc.

Competency: Maintain and repair small gas engines, dusters, sprayers, climbing equipment, etc. using recommended procedures.

Criterion Measure:

1. Maintenance and repair needs are identified.
2. Appropriate materials, tools, and equipment are selected for repairs.
3. Repairs are properly performed.
4. General maintenance schedule is set up and implemented.

Outline of Instructional Content

Skill/Process	Knowledge/Theory	Value/Attitude Concepts
I. Identify maintenance and repair needs.	I. Maintenance and repair identification A. Periodic inspection B. Observation	I. Recognizes that a good maintenance and repair program is necessary for efficient operation of small engines and equipment.
II. Select appropriate materials, tools, and equipment.	II. Maintenance and repair information A. Owner's manual B. Manufacturer's information C. Maintenance and repair manuals D. Books E. Seminars, short courses	II. Sensitive to maintenance and repair needs; identifies needs and promptly makes adjustments.
III. Perform repairs.	III. Basic repairs (procedures and techniques) A. Materials B. Tools	III. Keeps and uses updated reference materials on small engine and equipment maintenance and repair needs.
IV. Set up maintenance schedule and implement schedule. A. Lubricate. B. Check and maintain fluid levels. C. Check and replace filters.		

OUTLINE OF INSTRUCTIONAL CONTENT (CONTINUED)

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
	C. Equipment	
	IV. Maintenance schedule (procedures for development and implementation)	

ANALYSIS

CURRICULUM: Horticulture Technology

SUBJECT AREA: Building and Equipment Maintenance

TASK: (No. I124) Glaze windows.

COMPETENCY: Glaze windows (screening) on greenhouses to keep plants from receiving too much direct sun.

CRITERION MEASURE:

1. Glazing materials are correctly identified.
2. Glazing materials are selected that are best for selected greenhouses and plants grown.
3. Glazing materials are properly and evenly applied to the greenhouse.
4. Proper equipment is selected, used efficiently, and cleaned after use.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Identify glazing materials. II. Select materials that are best for the situation. III. Apply glazing materials. A. Remove dirt by brushing. B. Brush on materials. C. Spray materials. IV. Select proper tools and equipment. V. Clean tools and equipment after use.	I. Glazing materials (characteristics, use and application techniques) A. Paints B. Glazing compounds II. Tools and equipment (characteristics and use) A. Brushes B. Sprayers III. Cleaning tools and equipment A. Water B. Kerosene C. Cleaning compounds	I. Glazes greenhouses carefully in order not to damage them and to evenly apply glaze. II. Examines the characteristics of glazing materials to determine best ones to use for different situations.

ANALYSIS

CURRICULUM: Horticulture Technology

SUBJECT AREA: Building and Equipment Maintenance

TASK: (No. I125) Paint buildings, shelves, bins, etc.

COMPETENCY: Paint, stain, and otherwise coat facilities using brushes, rollers, and sprayers.

CRITERION MEASURE:

1. Appropriate covering material is selected for the job.
2. Appropriate brushes, rollers, and sprayers are selected for the job.
3. Materials are properly mixed and prepared.
4. Area is scraped, washed, and otherwise prepared for coating.
5. Structures are evenly and thoroughly covered with no runs.
6. Tools, equipment, and work area are thoroughly cleaned.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Select covering material. II. Mix coating materials. III. Scrape, wash, and otherwise prepare area. IV. Select brushes, rollers, and sprayers. V. Apply covering material. VI. Clean tools, equipment, and work area.	I. Materials (characteristics and uses) A. Clear coatings 1. Shellacs 2. Lacquers 3. Varnishes B. Stains 1. Acrylics 2. Finishes C. Paints 1. Latex 2. Oil base a. Flat b. Semi-gloss c. Glossy d. Primers	I. Appreciates the attractiveness of neatly coated surfaces.

OUTLINE OF INSTRUCTIONAL CONTENT (CONTINUED)

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
	II. Preparation A. Washing B. Scraping C. Mixing III. Application techniques A. Spraying 1. Equipment a. Adjustment b. Usage 2. Pattern B. Brushing 1. Brush types 2. Brush sizes C. Rolling 1. Roller types 2. Roller sizes IV. Cleaning agents A. Types B. Techniques	

ANALYSIS

CURRICULUM: Horticulture Technology

SUBJECT AREA: Building and Equipment Maintenance

TASK: (No. 1126) Recover greenhouses.

COMPETENCY: Recover greenhouses using all types of materials and appropriate tools and equipment.

CRITERION MEASURE:

1. Area is measured accurately.
2. Amount of materials is estimated accurately.
3. Appropriate tools and materials are selected.
4. Old or damaged covering is removed.
5. Area is cleaned and repairs made to greenhouse frame if needed.
6. Area is properly prepared for type of covering installed.
7. Covering material is properly and efficiently installed.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Measure area. II. Estimate amount of needed materials. III. Select tools and materials. IV. Remove covering. V. Clean area and make needed repairs. VI. Prepare area. VII. Install covering material.	I. Materials (identification and characteristics) A. Glass B. Plastic 1. Polyethylene film 2. Vinyl film 3. Mylar polyester film 4. Fiberglass II. Tools (identification and use) III. Procedures A. Measuring area B. Estimating amount of needed materials C. Removing old covering D. Cleaning area and making needed repairs	I. Performs measurements accurately and realizes that estimating needed materials accurately is very important to keeping costs down. II. Displays safety consciousness when handling and using tools and in all activities when removing and replacing greenhouse covers.

OUTLINE OF INSTRUCTIONAL CONTENT (CONTINUED)

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
	E. Preparing frame for new covering F. Installing covering material	

ANALYSIS

CURRICULUM: Horticulture Technology **SUBJECT AREA:** Equipment

TASK: (No. J127) Operate efficiently all equipment used in the nursery (tractors, tractor implements, plant augers, plant diggers, trenchers, front-end loaders, trucks, soil mixers, potting machines, etc.).

COMPETENCY: Operate vehicles and equipment used in the nursery industry safely and efficiently.

CRITERION MEASURE:

1. Vehicles and equipment are identified correctly.
2. All safety precautions and warnings are observed when operating vehicles and equipment.
3. Vehicles and equipment are operated according to recommendations of the manufacturer and material given in the owner's manual.
4. Appropriate vehicles and equipment are selected for the tasks to be completed.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Identify vehicles and equipment.	I. Vehicles and equipment (characteristics and identification) A. Trucks B. Tractors C. Tractor implements D. Plant augers E. Plant diggers F. Trenchers G. Front-end loaders H. Soil mixers I. Other	I. Displays safety consciousness when operating vehicles and equipment. II. Follows recommended operating procedures conscientiously. III. Recognizes that correct operation of vehicles and equipment reduces costs, saves times, reduces dangers or hazards, and results in higher quality work.
II. Operate vehicles and equipment safely and efficiently.	II. Operational procedures A. Manufacturer's recommendations B. Owner's manuals	

Outline of Instructional Content (Continued)

Skill/Process	Knowledge/Theory	Value/Attitude Concepts
	C. Equipment manuals and books D. Seminars and short courses	
III. Select appropriate vehicles and equipment for the tasks to be done.	III. Selecting appropriate equipment for tasks A. Type tasks B. Time C. Task requirements D. Location	
	IV. Safety precautions A. Equipment types B. Safety information	

ANALYSIS

CURRICULUM: Horticulture Technology

SUBJECT AREA: Equipment

TASK: (No. J128) Follow safety precautions for all equipment.

COMPETENCY: Operate all vehicles and equipment safely and use safety shields and other safety devices where applicable.

CRITERION MEASURE:

1. All vehicles and equipment are operated safely, following manufacturer's precautions and warnings.
2. Safety shields and devices located on vehicles and equipment are used, checked periodically, and adjustments are made if needed.
3. OSHA regulations are followed where appropriate.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Operate vehicles safely.	I. Safety information A. Safety manuals B. Owner's manuals C. OSHA regulations D. Manufacturer's recommendations	I. Understands the need for safety and the necessary precautions involved in equipment operation.
II. Use safety shields and devices.	II. Equipment operation A. Overloads B. Turning corners at reduced speeds on motorized vehicles C. Keeping hands and clothing clear of moving parts D. Stopping equipment when checking and repairing E. Following all manufacturer's precautions and warnings	II. Respects the potential hazards involved in the operation of the equipment.
III. Follow OSHA regulations.		III. Appreciates the importance of equipment protection.

OUTLINE OF INSTRUCTIONAL CONTENT (CONTINUED)

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
	III. Safety shields and devices A. Check periodically B. Use as recommended by manufacturer C. Adjust as needed IV. OSHA regulations (requirements as applied to safety in the horticulture industry)	

ANALYSIS

CURRICULUM: Horticulture Technology **SUBJECT AREA:** Equipment

TASK: (No.J129) Determine appropriate equipment to use for various jobs.

COMPETENCY: Select the equipment that performs the required jobs efficiently, safely, and economically.

CRITERION MEASURE:
1. The correct size and type of equipment is selected for identified jobs.
2. The amount of equipment needed for identified jobs is estimated accurately.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Select needed equipment. A. Estimate hours of equipment use. B. Determine type work needed. C. Compare work records of completed jobs that are similar to the current job.	I. Selection of equipment A. Type B. Amount C. Size D. Costs of choosing various types, amounts, and sizes E. Availability F. Type jobs undertaken	I. Appreciates the importance of the use of proper equipment for efficient workmanship and reduced costs.

ANALYSIS

CURRICULUM: Horticulture Technology **SUBJECT AREA:** Equipment

TASK: (No. J130) Make minor changes to agricultural and industrial equipment to adapt it to the nursery operation.

COMPETENCY: Make minor changes to agricultural and industrial equipment to adapt it to the nursery operation.

CRITERION MEASURE:
1. Equipment adaptations are identified that better fit the needs of the industry.
2. Appropriate materials are selected for equipment modifications.
3. Equipment is properly modified to adapt to nursery usage.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Identify equipment adaptations.	I. Equipment adaptations A. Equipment design B. Needs	I. Realizes a need for changes and adaptation of equipment for specific tasks.
II. Select appropriate materials.	II. Basic materials A. Types 1. Electrical 2. Hydraulic 3. Mechanical 4. Other B. Cost C. Quality D. Availability	II. Appreciates the usefulness of multi-purpose machines or equipment.
III. Modify equipment.	III. Mechanization fundamentals and equipment technology A. Hydraulic systems B. Weight distribution	III. Enjoys redesigning and making adaptations on equipment for more practical and/or economical use.

OUTLINE OF INSTRUCTIONAL CONTENT (CONTINUED)

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
	C. Electrical principles D. Welding skills G. Other IV. Procedures for making equipment adaptations	

ANALYSIS

CURRICULUM: Horticulture Technology **SUBJECT AREA:** Equipment

TASK: (No. J131) Make minor equipment repairs

COMPETENCY: Make minor equipment repairs using appropriate tools and recommended procedures.

CRITERION MEASURE:
1. Needed equipment repairs are correctly identified.
2. Equipment is repaired correctly following recommended procedures.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Identify repair problems.	I. Problem identification A. Periodic inspection B. Observation C. Knowledge of equipment and its operation	I. Realizes the need for the proper tools and repair equipment to facilitate repairs quickly and effectively.
II. Repair equipment.	II. Basic repair A. Owner's manual 1. Parts 2. Tools and equipment a. Wrenches b. Gauges 1. Pressure 2. Fluid c. Electrical meters d. Welder e. Oxyacetylene torch f. Other	II. Appreciates properly operating equipment.

OUTLINE OF INSTRUCTIONAL CONTENT (CONTINUED)

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
	B. Books	
	C. Seminars and short courses	
	III. Procedures necessary to make repairs	

ANALYSIS

CURRICULUM: Horticulture Technology **SUBJECT AREA:** Construction

TASK: (No. K132) Apply basic carpentry skills in building display beds, slathouses, storage sheds, greenhouses, and other construction projects.

COMPETENCY: Use basic carpentry skills in building display beds, slathouses, storage sheds, greenhouses, and other construction projects under the supervision of a skilled carpenter.

CRITERION MEASURE:

1. Construction plans are correctly read and interpreted.
2. Carpentry tools are correctly identified.
3. Appropriate materials and tools are chosen and prepared for building the construction project.
4. The project is correctly constructed to meet plan requirements.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Read construction plans.	I. Plans A. Types B. Measurements C. Plan views 1. Cross-section 2. Front 3. Top D. Material lists E. Other	I. Listens attentively to directions. II. Practices carpentry skills. III. Appreciates well built and attractive facilities.
II. Select materials.	II. Materials A. Cost B. Quality C. Availability	IV. Display safety consciousness.

OUTLINE OF INSTRUCTIONAL CONTENT (CONTINUED)

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
III. Identify and use carpentry tools.	III. Tools A. Saws B. Tape measures C. Screwdrivers D. Hammers E. Planes F. Miter box G. Carpenter's square	
IV. Prepare area and materials.	IV. Construction (techniques and application) A. Measuring B. Cutting C. Constructing D. Finishing	
V. Construct project. A. Prepare for and pour footings. B. Construct foundation. C. Install sills, studs, joists, rafters, etc. D. Install siding and roof. E. Complete finish work.		

ANALYSIS

CURRICULUM: Horticulture Technology **SUBJECT AREA:** Construction

TASK: (No. K133) Install fences using different types of materials.

COMPETENCY: Install fences using various types of materials and techniques.

CRITERION MEASURE:
1. Construction plans are correctly read and interpreted.
2. Appropriate fence type and materials are selected.
3. Area and materials are prepared for installation.
4. Fence is constructed and finished to meet plan requirements.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Read and interpret construction plans.	I. Reading construction plans or blueprints A. Dimension B. Views C. Scales	I. Realizes the importance of selecting fence types that best fit landscape schemes.
II. Select fence type and materials.	II. Fence types (characteristics and best usages) A. Split-rail B. Woven C. Picket D. Chain link E. Board F. Other	
III. Prepare area and materials.		
IV. Construct fence.		

OUTLINE OF INSTRUCTIONAL CONTENT (CONTINUED)

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
	III. Materials (advantages and disadvantages) A. Types 1. Wood a. Redwood b. Cedar c. Locust d. Treated pine e. Other 2. Metal B. Cost C. Quality D. Availability IV. Installation techniques A. Measuring area B. Staking C. Digging holes D. Installing posts E. Packing soil F. Installing cross numbers G. Leveling fence H. Finishing surface 1. Staining 2. Scaling 3. Painting V. Functions of fencing A. Privacy B. Background C. Shielding	

ANALYSIS

CURRICULUM: Horticulture Technology **SUBJECT AREA:** Construction

TASK: (No. K134) Install walls using railroad ties, block, brick, rock, or other materials.

COMPETENCY: Construct walls using railroad ties, block, brick, rock, or other materials by following recommended procedures.

CRITERION MEASURE:
1. Construction plans are correctly read and interpreted.
2. Appropriate materials are selected.
3. Area and materials are properly prepared for wall installation.
4. Walls are constructed and finished to meet plan requirements.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Read construction plans.	I. Construction plans or blueprints A. Dimensions B. Views C. Scales	I. Appreciates attractive, well constructed walls. II. Shows interest in trying to please customers.
II. Select materials.	II. Walls (characteristics and usage) A. Type 1. Free-standing 2. Retaining B. Techniques 1. Dry wall 2. Mortar	
III. Prepare area and materials.	III. Materials (advantages and disadvantages) A. Types 1. Railroad ties	

OUTLINE OF INSTRUCTIONAL CONTENT (CONTINUED)

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
	2. Concrete blocks 3. Brick 4. Rock 5. Other B. Cost C. Quality D. Availability	
IV. Construct wall.	IV. Installation techniques A. Measuring B. Staking C. Preparing area D. Cutting E. Positioning F. Securing G. Finishing	

ANALYSIS

CURRICULUM: Horticulture Technology **SUBJECT AREA:** Construction

TASK: (No. K135) Construct planters.

COMPETENCY: Construction planters by following prepared blueprints and utilizing proper construction techniques.

CRITERION MEASURE:

1. Construction plans are correctly read and interpreted.
2. Appropriate materials are selected.
3. Materials are measured and cut accurately for construction.
4. Planters are correctly constructed and finished to meet plan requirements.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Read construction plans.	I. Construction plans A. Dimensions B. Views 1. Cross-section 2. Front 3. Top 4. Side C. Material lists D. Scale	I. Realizes that well constructed and attractive planters are necessary for good sales. II. Demonstrates self-reliance in working independently. III. Displays safety consciousness when using tools.
II. Select materials.	II. Materials A. Types 1. Wood 2. Concrete 3. Brick 4. Stone 5. Other	

OUTLINE OF INSTRUCTIONAL CONTENT (CONTINUED)

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
	B. Cost C. Quality D. Availability	
III. Prepare materials.	III. Tools A. Saws B. Tape measures C. Screwdrivers D. Hammers E. Planers F. Miter box G. Carpenter's square	
IV. Construct planter according to construction plans.	IV. Construction techniques A. Measuring area B. Cutting C. Constructing D. Finishing	

ANALYSIS

CURRICULUM: Horticulture Technology **SUBJECT AREA:** Construction

TASK: (No. K136) Construct garden bench seats.

COMPETENCY: Construct garden bench seats by following prepared blueprints and utilizing proper construction techniques.

CRITERION MEASURE:
1. Construction plans are correctly read and interpreted.
2. Appropriate materials are selected.
3. Materials are measured and cut accurately.
4. Benches are correctly constructed and finished to meet plan requirements.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Read construction plans.	I. Construction plans A. Dimensions B. Views 1. Cross-section 2. Front 3. Top 4. Side C. Materials lists D. Scale	I. Displays safety consciousness when using tools. II. Exhibits patience in measuring, cutting, and constructing to be as neat and accurate as possible.
II. Select materials.	II. Materials A. Types 1. Wooden 2. Masonry 3. Other B. Cost C. Quality D. Availability	

OUTLINE OF INSTRUCTIONAL CONTENT (CONTINUED)

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
III. Prepare materials.	III. Tools A. Saws B. Tape measures C. Screwdrivers D. Hammers E. Planers F. Carpenter's square	
IV. Construct benches according to construction plans.	IV. Construction technqiues A. Measuring B. Cutting C. Constructing D. Finishing	

ANALYSIS

CURRICULUM: Horticulture Technology **SUBJECT AREA:** Construction

TASK: (No. K137) Install walks and patios using brick, concrete, and other materials.

COMPETENCY: Install walks and patios using brick, concrete, and other materials by following blueprints and utilizing accepted construction techniques.

CRITERION MEASURE:
1. Construction plans are correctly read and interpreted.
2. Appropriate materials are selected.
3. Area and materials are properly prepared for installation.
4. Walks and patios are correctly installed and finished to meet construction requirements.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Read construction plans.	I. Construction plans A. Dimensions B. Sketches C. Material lists D. Scale	I. Displays safety consciousness when using tools.
II. Select materials.	II. Materials A. Types 1. Brick a. Patterns 1. Basket-weave 2. Herring bone 3. Running bond 4. Variations 2. Concrete a. Smooth finish b. Rough finish c. Exposed aggregate	II. Realizes that neat, well built walks and patios meet customer demands.

OUTLINE OF INSTRUCTIONAL CONTENT (CONTINUED)

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
	3. Wood 4. Slate 5. Gravel 6. Asphalt 7. Flagstone B. Cost C. Quality D. Availability	
III. Prepare area and materials.	III. Installation procedures A. Preparing area B. Construction techniques C. Finishing	
IV. Install walks, patios.		

Appendix

ANALYSIS

CURRICULUM: Horticulture Technology **SUBJECT AREA:** Construction

TASK: (No.K138) Erect suitable lighting for recreation and garden areas.

COMPETENCY: Install suitable lighting for recreation and garden areas.

CRITERION MEASURE:

1. Appropriate type of lighting system is selected for area.
2. Appropriate type of lighting system is correctly designed for location.
3. Appropriate materials are selected.
4. Area and materials are properly prepared for installation.
5. Lighting system correctly installed to meet plan requirements and passes electrical inspection.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Select type of lighting.	I. Functions A. Protection B. Enhancement	I. Displays safety consciousness.
II. Design system.	II. Types A. Up-lighting B. Back-lighting	II. Shows awareness of the importance of good lighting.
III. Select materials.	III. Systems A. 110-volt B. 220-volt C. 120-volt	III. Practices recommended principles and procedures in setting up lighting system.
IV. Prepare area and materials.	IV. Scheme requirements A. Location 1. Patio 2. Walk	
V. Install system.		

Outline of Instructional Content (Continued)

Skill/Process	Knowledge/Theory	Value/Attitude Concepts
	3. Steps 4. Plants 5. Other B. Power source V. Materials A. Types B. Cost C. Quality D. Availability VI. Installation procedures A. Digging trenches B. Laying wire C. Installing fixtures D. Installing timers E. Installing voltage reducers F. Checking system	

ANALYSIS

CURRICULUM: Horticulture Technology **SUBJECT AREA:** Construction

TASK: (No. K139) Install proper edging for various landscape areas.

COMPETENCY: Prepare the area and install edging for various landscape areas.

CRITERION MEASURE:
1. Appropriate type of edging is selected for landscape areas.
2. Appropriate materials are selected.
3. Area and materials are prepared for installation.
4. Edging is installed following recommended procedures.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Select type of edging.	I. Materials A. Types (advantages and disadvantages) 1. Aluminum 2. Heavy-duty steel 3. Plastic 4. Treated wood 5. Brick 6. Concrete blocks 7. Other B. Cost C. Quality D. Availability E. Quantity	I. Realizes that the edging must be attractive and is appropriate for the landscape scheme.
II. Select materials.		
III. Prepare area and materials.		
IV. Install edging.	IV. Installation A. Preparing area B. Laying materials C. Securing	

ANALYSIS

CURRICULUM: Horticulture Technology

SUBJECT AREA: Construction

TASK: (No. K140) Construct rock gardens and other specialized areas.

COMPETENCY: Construct rock gardens and other specialized areas following construction plans and recommended procedures.

CRITERION MEASURE:

1. Construction plans are correctly read and interpreted.
2. Appropriate construction and plant materials are selected for area.
3. Area and materials are properly prepared for construction.
4. Area and plants are correctly constructed and installed to meet plan specifications.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Read construction plans.	I. Construction plans A. Dimensions B. Sketches C. Material lists D. Scale	I. Examines materials carefully for quality, attractivenss, and durability.
II. Select construction materials.	II. Materials (characteristics and uses)	II. Follows directions and instructions from supervisor carefully.
III. Select plant materials.	III. Criteria A. Location B. Design C. Plant materials D. Construction materials E. Maintenance requirements	III. Practices cooperation in group activities.
IV. Prepare area and materials.		
V. Construct project.		

Outline of Instructional Content (Continued)

Skill/Process	Knowledge/Theory	Value/Attitude Concepts
	IV. Installation procedures A. Preparing area B. Installing rocks and other materials C. Installing plants D. Mulching	

ANALYSIS

CURRICULUM: Horticulture Technology

SUBJECT AREA: Advertising and Selling Plants

TASK: (No L141) Advertise products effectively through newspapers, magazines, sales leaflets, radio, television, store displays, special displays, etc.

COMPETENCY: Advertise products effectively through newspapers, magazines, sales leaflets, radio, television, store displays, special displays, etc.

CRITERION MEASURE:

1. The ad is eye-catching.
2. The ad is appropriate for the product.
3. The ad utilizes the appropriate media.
4. The ad increases the amount of products sold.
5. The ad increases the number of customers in the establishment.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Prepare advertisement for horticulture products.	I. Types of advertising A. Newspapers B. Magazines C. Sales leaflets D. Radio E. Television F. Store displays G. Special displays H. Miscellaneous	I. Understands the importance of preparing effective ads.
	II. Disadvantages and advantages of ad types	II. Realizes the importance of choosing correct type of ad for situation.
	III. Preparation A. Using agencies B. Using radio, TV, or newspaper ad departments	III. Displays interpersonal relationships with experts in advertising field.

OUTLINE OF INSTRUCTIONAL CONTENT (CONTINUED)

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
	C. Preparing own ads 1. Cost of various type ads 2. When to advertise 3. Length of time to run ad 4. Copy material 5. Audience D. Correct ad to use for type of product	

ANALYSIS

CURRICULUM: Horticulture Technology

SUBJECT AREA: Advertising and Selling Plants

TASK: (No. L142) Use supplier advertising materials effectively.

COMPETENCY: Utilize supplier prepared materials to supplement advertising efforts.

CRITERION MEASURE:
1. The materials are attractive.
2. The materials fit in with owner materials.
3. Appropriate media is used for ads.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Select attractive ad materials.	I. Attractiveness A. Color B. Size C. Location D. Grouping	I. Realizes the importance of attractiveness in advertising.
II. Fit supplied ads with owner materials.	II. Fitting supplier ads with owner materials A. Seasonal B. Sales items C. Theme	II. Recognizes the need for balance between supplied ads and owner produced ads.
III. Choose appropriate media.	III. Principles for choosing appropriate media	

ANALYSIS

CURRICULUM: Horticulture Technology

SUBJECT AREA: Advertising and Selling Plants

TASK: (No. L143) Identify customer needs and wants.

COMPETENCY: Identify plants and other needs and desires of the customer.

CRITERION MEASURE:

1. Material identified satisfies the customer sufficiently to create desire to purchase.
2. Material identified fits into the customer's landscape scheme or design.
3. Customers are treated courteously at all times.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Determine customer needs and desires.	I. Determining customer needs A. Description of area B. Plant likes and dislikes	I. Voluntarily assists customers.
II. Determine plants and other materials to fulfill need.	II. Choosing plants A. Use B. Cost C. Average life D. Replacement cost E. Color scheme F. Cultural requirements	II. Enjoys meeting customers.
	III. Principles to encourage customers to purchase other items	III. Demonstrates patience in assisting customers.
		IV. Treats customers courteously.

ANALYSIS

CURRICULUM: Horticulture Technology **SUBJECT AREA:** Advertising and Selling Plants

TASK: (No. L144) Describe to customer the purpose and qualities of merchandise for sale.

COMPETENCY: Describe the purposes and qualities of merchandise to prospective buyers.

CRITERION MEASURE:
1. The merchandise is described accurately.
2. The purposes are stated clearly.
3. The qualities are stated truthfully.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. List purposes of products.	I. Purposes A. Uses B. Disadvantages/advantages C. Alternatives	I. Voluntarily provides information to customers.
II. List qualities of products.	II. Qualities A. Durability B. Dependability C. Conditions for use D. Trade-in value E. Cautions	II. Answers questions cheerfully and truthfully. III. Demonstrates proficiency in giving accurate and current information.

ANALYSIS

CURRICULUM: Horticulture Technology

SUBJECT AREA: Advertising and Selling Plants

TASK: (No. L145) Take orders for sales or service by telephone.

COMPETENCY: Accurately take telephone orders for sales or service.

CRITERION MEASURE:
1. Orders are accurately recorded.
2. Good telephone manners are exhibited.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Take order information over telephone.	I. Taking information A. Telephone etiquette 1. Voice 2. Manners B. Obtaining correct information from customers 1. Items 2. Quantity 3. Type 4. Service required 5. Name 6. Address 7. Telephone number	I. Listens attentively to customers. II. Exhibits good telephone manners. III. Shows interest in the customer.

ANALYSIS

CURRICULUM: Horticulture Technology

SUBJECT AREA: Advertising and Selling Plants

TASK: (No. L146) Quote cost of plants.

COMPETENCY: Quote cost of plants to customers from recall or by using price lists.

CRITERION MEASURE: Cost of plants are accurately quoted to customers by recall and by using price lists.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Quote cost of plants by recall and by using price lists.	I. Quoting cost of plants A. Type B. Variety C. Size D. Age	I. Realizes the importance of accurately quoting plant costs to customers.
	II. Procedures for learning plant costs A. Recall B. Using price lists	II. Makes a concerted effort to learn as many plant prices as possible.

ANALYSIS

CURRICULUM: Horticulture Technology

SUBJECT AREA: Advertising and Selling Plants

TASK: (No. L147) Make cost estimates on customer orders.

COMPETENCY: Estimate final costs on customer orders.

CRITERION MEASURE:

1. The estimated cost of materials is reasonably close to actual cost.
2. The estimated cost of installation is reasonably close to actual cost.
3. The markup includes all pertinent components.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Estimate cost of plants and materials.	I. Materials costs A. Plants B. Soil amendments C. Mulch D. Miscellaneous	I. Realizes the importance of using realistic costs of plants and materials. II. Realizes the importance of accurately estimating installation costs.
II. Estimate cost of installation.	II. Installation costs A. Time B. Number of people C. Equipment	III. Understands the importance of satisfying customers.
III. Determine markup.	III. Markup A. Guarantee B. Maintenance C. Overhead D. Profit	IV. Recognizes the need for making a profit.

OUTLINE OF INSTRUCTIONAL CONTENT (CONTINUED)

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
IV. Determine final price.	IV. Final price A. Materials, installation, and markup B. Pricing policies	

ANALYSIS

CURRICULUM: Horticulture Technology

SUBJECT AREA: Advertising and Selling Plants

TASK: (No. L148) Use effective interpersonal relationships in dealing with customers.

COMPETENCY: Effective interpersonal relationships are demonstrated in dealing with customers.

CRITERION MEASURE:
1. Courteousness, tactfulness, and truthfulness are practiced at all times.
2. Ethical behavior is demonstrated constantly.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Demonstrates courteousness, tactfulness, and truthfulness.	I. Principles of courtesy A. Voice B. Manner	I. Shows sensitivity to customer desires.
II. Practices ethical behavior.	II. Principles of tactfulness	II. Accepts customer complaints willingly and cheerfully.
	III. Principles of truthfulness	III. Enjoys helping customers.
	IV. Principles of ethics	IV. Recognizes the need for being ethical, courteous, tactful, and truthful.
		V. Realizes that the customer is almost always right.

ANALYSIS

CURRICULUM: Horticulture Technology

SUBJECT AREA: Advertising and Selling Plants

TASK: (No.L149) Label and price mark merchandise.

COMPETENCY: Label and price mark merchandise correctly.

CRITERION MEASURE:
1. The label and price are accurate.
2. The label and price are legible.
3. The label and price are attached securely.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Label merchandise.	I. Labeling A. Already-prepared labels 1. Match with correct merchandise 2. Attach securely B. Making labels 1. Use right information 2. Legible 3. Attach securely	I. Understands the importance of accurate labels and prices. II. Recognizes the need for legible labels. III. Understands the necessity of attaching labels securely.
II. Price mark merchandise.	II. Pricing A. Use correct price B. Attach label securely	

ANALYSIS

CURRICULUM: Horticulture Technology

SUBJECT AREA: Advertising and Selling Plants

TASK: (No. L150) Display store merchandise for sale.

COMPETENCY: Display merchandise for sale.

CRITERION MEASURE:
1. The merchandise is arranged attractively.
2. The display attracts attention.
3. The display is located conveniently to customer traffic.
4. The display increases customer purchases of merchandise.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Design the display.	I. Display design A. Types of display 1. Racks 2. Counter (table) 3. Walls 4. Floor B. Store location C. Customer traffic D. Color scheme	I. Understands the importance of a well-designed and attractive display. II. Displays safety consciousness in setting up display.
II. Set up the display.	II. Display set-up A. Arrange tables, racks, etc. B. Prepare signs C. Safety D. Cleanliness	

OUTLINE OF INSTRUCTIONAL CONTENT (CONTINUED)

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
III. Arrange merchandise on the display.	III. Arrangement of merchandise A. Size of product B. Grouping C. Attractiveness	

ANALYSIS

CURRICULUM: Horticulture Technology

SUBJECT AREA: Advertising and Selling Plants

TASK: (No. L151) Wrap and/or package merchandise sold.

COMPETENCY: Wrap and/or package items sold.

CRITERION MEASURE:

1. The wrapping is secure.
2. The wrapping is appropriate for the product.
3. The wrapping prevents damage to the product.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Wrap and/or package merchandise.	I. Proper wrapping procedures A. Size of item B. Type of item C. Secure D. Neat E. Prevent damage	I. Realizes the importance of choosing appropriate wrapping for merchandise.
		II. Recognizes the need to wrap merchandise securely to prevent damage.
		III. Shares knowledge of proper wrapping techniques of others.

ANALYSIS

CURRICULUM: Horticulture Technology

SUBJECT AREA: Advertising and Selling Plants

TASK: (No.L152) Deliver or ship merchandise sold.

COMPETENCY: Deliver or ship purchased items to the correct address.

CRITERION MEASURE:

1. Correct information is obtained from customer.
2. The merchandise is properly wrapped.
3. The merchandise is labeled for delivery/shipping.
4. The merchandise is delivered to the correct address.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Obtain necessary information from customer.	I. Information A. Name and address B. Clear directions to delivery site C. Charges D. Preparing necessary forms	I. Shows interest for getting correct information from customer.
II. Wrap items.	II. Wrapping merchandise A. Type of wrapping B. Size C. Prepare label with correct address	II. Understands the importance of adequate wrapping.
III. Deliver to customer.	III. Delivering/shipping A. Loading/unloading B. Getting required signatures	III. Accepts responsibility for merchandise not delivered to appropriate customer.
		IV. Conscientiously completes necessary forms.

ANALYSIS

CURRICULUM: Horticulture Technology

SUBJECT AREA: Advertising and Selling Plants

TASK: (No. L153) Rent equipment to customers.

COMPETENCY: Rent lawn and garden equipment to customers.

CRITERION MEASURE:

1. Proper equipment for the job is rented.
2. Forms are properly completed.
3. Customers are treated courteously.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Explain operation of machine.	I. Operation A. Basic engine knowledge B. Working knowledge of equipment operation C. Demonstration D. Safety and maintenance features	I. Voluntarily performs demonstration of operation of the equipment to customers.
II. Explain rental conditions.	II. Rental conditions A. Price B. Time length C. Damage policy	II. Recognizes the importance of providing clear explanations of rental terms to customers.
III. Write up rental form.	III. Rental form A. Pertinent information B. Price C. Conditions	III. Accepts responsibility for accurately completing rental forms.
		IV. Appreciates the value of good customer relations.

ANALYSIS

CURRICULUM: Horticulture Technology

SUBJECT AREA: Advertising and Selling Plants

TASK: (No. L154) Follow up sales to determine customer satisfaction.

COMPETENCY: Customers contacted to determine degree of satisfaction from merchandise bought.

CRITERION MEASURE:
1. The follow-up is done in a friendly manner.
2. Accurate information is obtained upon which to base valid decisions.
3. The data is accurately compiled.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Set up customer directory.	I. Customer directory A. Name B. Address C. Telephone D. Merchandise purchased and date	I. Shows courteousness to customers in follow-up procedure.
II. Telephone customers.	II. Telephone survey A. Courteous B. Customer satisfaction with merchandise C. Customer complaints D. Follow-up complaints	II. Listens attentively to customer complaints.
III. Write customers.	III. Mail survey A. Customer satisfaction with merchandise	III. Shows awareness of the importance of obtaining and compiling accurate data.
		IV. Sensitive to the need for quick follow-ups to customer complaints.

Outline of Instructional Content (Continued)

Skill/Process	Knowledge/Theory	Value/Attitude Concepts
	B. Customer complaints C. Follow-up complaints	
IV. Question customer when he/she returns to store.	IV. Personal interview A. Customer satisfaction with merchandise B. Customer complaints C. Follow-up complaints	
V. Compile data.	V. Data A. Number of items of specific merchandise sold B. Number satisfied with merchandise C. Number dissatisfied with merchandise D. Number of follow-ups made E. Dates or time periods F. Other pertinent information	

ANALYSIS

CURRICULUM: Horticulture Technology

SUBJECT AREA: Advertising and Selling Plants

TASK: (No. L155) Prepare and keep current price lists and sales catalogs.

COMPETENCY: Prepare and update price lists and catalogs as needed to keep customers informed.

CRITERION MEASURE:
1. The price lists/catalogs are comprehensive.
2. The price lists/catalogs are accurate.
3. The price lists/catalogs are easily read and understood.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Prepare price lists/catalogs.	I. Preparing price lists/catalogs A. Listing items B. Descriptions C. Discounts D. Accurate prices E. Terms	I. Recognizes the necessity of providing current, accurate, comprehensive and easily read price lists and catalogs to customers and prospective customers.
II. Update price lists/catalogs.	II. Updating price lists/catalogs A. Current prices B. Adding new items C. Deleting old items D. Changing terms E. Changing discounts F. Reorganizing for easier reference G. Periodic review and update	II. Alert to sudden price and other changes in merchandise.
		III. Accept responsibility for inaccurate information in price lists/catalogs.

Appendix

ANALYSIS

CURRICULUM: Horticulture Technology

SUBJECT AREA: Advertising and Selling Plants

TASK: (No. L156) Suggest to customers plant materials to be used under their situations.

COMPETENCY: Suggest plant materials to be used under the situations customers describe.

CRITERION MEASURE:
1. Pertinent questions are asked customers to obtain needed information.
2. Customers are treated courteously.
3. The suggestions are appropriate.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Secure information from customers.	I. Information A. Soil type B. Drainage C. Light D. Desired use E. Likes and dislikes of customer F. Price range G. Plant material presently used in area, if any	I. Realizes the importance of getting accurate information. II. Sensitive to asking appropriate questions. III. Sensitive to customers' needs and desires.
II. Make suggestions.	II. Suggestions A. Base decisions on information obtained B. Alternatives available	IV. Accepts responsibility for suggestions offered. V. Treats customers courteously at all times.
	III. Questioning procedures	

ANALYSIS

CURRICULUM: Horticulture Technology

SUBJECT AREA: Advertising and Selling Plants

TASK: (No. L157) Read and interpret landscape plans drawn by designers and architects.

COMPETENCY: Read and interpret landscape plans drawn by landscape designers/architects.

CRITERION MEASURE:

1. Plants are identified accurately.
2. Symbols are read accurately.
3. The scale and legend are read accurately.
4. Specifications are determined correctly.
5. Landscape plans are interpreted correctly.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Identify symbols.	I. Symbols A. Plants B. Materials	I. Appreciates the usefulness of landscape plans.
II. Identify abbreviations.	II. Abbreviations A. Plants B. Materials	II. Shows interest in learning as much as possible about landscape plans.
III. Read scale and legend.	III. Scale and legend A. Spacing B. Quantities C. Sizes	III. Recognizes the importance of reading a prepared plan correctly.
IV. Determine specifications.	IV. Specifications	
V. Interpret total plan.	V. Interpretation procedures	

ANALYSIS

CURRICULUM: Horticulture Technology

SUBJECT AREA: Advertising and Selling Plants

TASK: (No.L158) Develop and verify customer directories.

COMPETENCY: Develop and verify customer directories.

CRITERION MEASURE:
1. The directory is complete.
2. The directory is accurate.
3. The directory is current.
4. The directory is neat and easily readable.
5. The directory is verified by various acceptable methods.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Compile list of customers.	I. Customers A. Current customers 1. Sales people 2. Sales slips 3. Charge accounts B. Prospective customers 1. Purchasing lists 2. Sales 3. Advertising 4. Special promotions	I. Recognizes the importance of keeping an accurate, current, and usable directory of customers and prospective customers. II. Alert to changes in addresses of current customers and new or prospective customers.
II. Set up directory.	II. Directory A. Alphabetized names B. Addresses C. Telephone numbers D. Merchandise purchased and date	III. Treats customers courteously at all times.

OUTLINE OF INSTRUCTIONAL CONTENT (CONTINUED)

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
III. Verify directory.	III. Verifying A. Charge accounts B. Returned catalogs C. Sales records D. Telephone survey E. Mail survey F. Personal interview	

ANALYSIS

CURRICULUM: Horticulture Technology

SUBJECT AREA: Advertising and Selling Plants

TASK: (No. L159) Use cash register, adding machine, calculator, and other recording devices.

COMPETENCY: Operate cash register, adding machine, and calculator to figure customers' bills and make cash and charge transactions.

CRITERION MEASURE:
1. Machines are operated accurately and efficiently.
2. Cash and charge transactions are figured accurately with tickets and receipts completed correctly.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Operate cash register, adding machine, and calculator. II. Write tickets and receipts for cash and charge transactions.	I. Machine operation procedures A. Cash register B. Adding machine C. Calculator II. Procedures for making cash and charge transactions	I. Practices operating cash registers, adding machines, and calculators to become proficient.

ANALYSIS

CURRICULUM: Horticulture Technology

SUBJECT AREA: Advertising and Selling Plants

TASK: (No. L160) Advise customers on fertilization, disease, and insect control on current information.

COMPETENCY: Advise customers on fertilization, disease, insect control on plants purchased and on other plants customer requests information on.

CRITERION MEASURE:
1. The advice is accurate and up to date.
2. Sources of additional information are provided.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Advise on fertilization.	I. Fertilization A. Recommended type B. Amount C. How to apply D. Where to apply E. When to apply	I. Volunteers information on fertilization, disease and insect control. II. Recognizes the importance of providing accurate information.
II. Advise on disease control.	II. Diseases identification A. Identification B. How to control C. Proper material D. Cautions	III. Listens to customers' inquiries attentively.
III. Advise on insect control.	III. Insects A. Identification B. How to control C. Proper material D. Cautions	IV. Enjoys keeping current on fertilization, insects, and diseases.

OUTLINE OF INSTRUCTIONAL CONTENT (CONTINUED)

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
IV. Provide sources of additional information.	IV. Additional information sources A. Pamphlets B. Books C. Agricultural Extension Service D. Other	

Appendix

ANALYSIS

CURRICULUM: Horticulture Technology

SUBJECT AREA: Advertising and Selling Plants

TASK: (No. L161) Answer customer complaints.

COMPETENCY: Answer customer complaints quickly and accurately, being courteous to the customer at all times.

CRITERION MEASURE:
1. The complaint is answered courteously.
2. The complaint is handled promptly.
3. The information provided is correct.
4. The supervisor is notified immediately when information is now known or not available quickly.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Obtain information on complaint. II. Provide appropriate information.	I. Manner A. Courteous B. Concerned C. Prompt II. Follow-through A. Nature of complaint B. Appropriate information obtained C. Notify supervisor or proper company official D. Information provided to satisfy customer	I. Sensitive to customer problems. II. Listens to customer. III. Treats customer courteously at all times. IV. Voluntarily assists customer in answering complaints. V. Recognizes the importance of handling complaints promptly and accurately.

ANALYSIS

CURRICULUM: Horticulture Technology

SUBJECT AREA: Advertising and Selling Plants

TASK: (No.L162) Write up customer orders.

COMPETENCY: Write up orders for merchandise purchased.

CRITERION MEASURE:

1. The items are identified properly.
2. The necessary descriptive information is included.
3. The quantities are correct.
4. The prices are correct.
5. The sales tax is accurate.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Obtain preliminary information.	I. Preliminary information A. Name and address of customer B. Cash or charge sale C. Delivery instructions	I. Realizes the importance of obtaining correct information.
II. Obtain purchase information.	II. Purchase information A. Item description B. Item quantity C. Price	II. Recognizes the need for making accurate calculations in terms of customer and employer satisfaction.
III. Calculate charges.	III. Calculations A. Item extensions B. Subtotals C. Discounts D. Sales tax E. Total price	III. Accepts responsibility for math errors.

ANALYSIS

CURRICULUM: Horticulture Technology

SUBJECT AREA: Advertising and Selling Plants

TASK: (No. L163) Water and properly care for plants on display and/or storage.

COMPETENCY: Water, fertilize, weed, stake, prune, and provide correct environment for plants in the business establishment that are stored or on display to maintain healthy stock.

CRITERION MEASURE:

1. The plants are watered periodically to prevent wilting and other damage.
2. The plants are fertilized to maintain growth and healthy appearance.
3. The plants are weeded for attractive appearance.
4. The plants are pruned as needed to maintain proper growth habits.
5. The plants are staked as needed to maintain proper growth habits.
6. The plants are provided with proper light and temperature for healthy appearance.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Water plants. II. Fertilize plants. III. Weed plants. IV. Prune plants V. Stake plants. VI. Provide light and temperature requirements.	I. Maintaining healthy plants A. Watering 1. When 2. Amount 3. Method B. Fertilizing 1. When 2. Amount 3. Method C. Weeding 1. When 2. Method D. Pruning 1. When 2. Method E. Staking 1. When 2. Method	I. Shows appreciation for good, healthy plants. II. Assumes responsibility that displayed and/or stored plants are properly cared for. III. Finds pleasure in showing customers plants that are vigorous and healthy. IV. Enjoys seeing customers appreciate beautiful, healthy stock.

Outline of Instructional Content (Continued)

Skill/Process	Knowledge/Theory	Value/Attitude Concepts
	F. Lighting requirements 1. Full sun 2. Partial shade 3. Full shade 4. Amount for 24-hour period G. Temperature requirements 1. Minimum for various plant species 2. Maximum for various plant species	

ANALYSIS

CURRICULUM: Horticulture Technology

SUBJECT AREA: Advertising and Selling Plants

TASK: (No. L164) Repair or reball balled and burlapped plants.

COMPETENCY: Repair and reball balled and burlapped plants to meet customer satisfaction.

CRITERION MEASURE:
1. The reballed or reburlapped plant is securely held.
2. The reballed or reburlapped plant is firm.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Repair balled and burlapped plants.	I. Repairing A. Retucking B. Nailing C. Fastening with cord	I. Voluntarily repairs or reballs plants when needed.
II. Reball plants.	II. Reballing A. Use of proper burlap size B. Tying burlap C. Tucking D. Nailing E. Fastening with cord	

ANALYSIS

CURRICULUM: Horticulture Technology

SUBJECT AREA: Advertising and Selling Plants

TASK: (NO.L165) Properly handle and load carts, trailers, trucks, or other vehicles for transportation of plants within the nursery and to delivery points.

COMPETENCY: Handle and load plants onto carts, trailers, trucks, or other vehicles without damaging plants and secure plants on vehicle.

CRITERION MEASURE:
1. The plants are lifted without damaging roots, stems, or foliage.
2. The plants are loaded onto vehicles and stacked without damaging them.
3. The plants are secured without damage and will not shift during transporting.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Lift plants.	I. Lifting A. Containers 1. Rim 2. Bottom B. Balled and burlapped C. Bare-root	I. Examines plants before loading. II. Carefully handles plants to avoid damage. III. Recognizes damage as it occurs.
II. Load plants.	II. Loading A. Container 1. Set flat 2. Stack on side B. Balled and burlapped 1. Set flat 2. Stacked C. Bare-root	IV. Accepts responsbility for damaged plants during loading or transporting.

OUTLINE OF INSTRUCTIONAL CONTENT (CONTINUED)

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
III. Secure plants.	III. Securing A. Tying B. Position without shifting	

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ANALYSIS

CURRICULUM: Horticulture Technology **SUBJECT AREA:** Records

TASK: (No. M166) Take periodic inventory.

COMPETENCY: Understand, apply, and complete inventory forms.

CRITERION MEASURE:
1. Specific inventory forms necessary for given time period are determined.
2. Inventory forms are completed accurately and legibly.
3. Reasons for taking inventory are listed correctly.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Determine specific inventory forms for specific time periods.	I. Inventory forms A. Itemized B. Costs C. Unitemized	I. Recognizes the necessity of being very accurate in taking inventory.
II. Determine items for inventory.	II. Inventory items A. Perishables B. Non-perishables	II. Exhibits patience when taking inventory.
III. Complete forms.	III. Inventory periods A. Daily B. Monthly C. Yearly D. Quarterly E. Semi-annually	III. Volunteers to work overtime when taking inventory or when extra manhours are needed for various tasks.
		IV. Cooperates with other employees to assure a quality job.

OUTLINE OF INSTRUCTIONAL CONTENT (CONTINUED)

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
	IV. Operation of business machines A. Typewriters B. Calculators C. Duplicators D. Adding machines V. Procedures for taking inventory VI. Reasons for inventory A. Accurate records B. Tax purposes C. Reordering supplies D. Other	

ANALYSIS

CURRICULUM: Horticulture Technology **SUBJECT AREA:** Records

TASK: (No. M167) Keep records of receipts and expenses.

COMPETENCY: File and provide data periodically on receipt and expense records according to sales, purchases, public relations, and other needed categories.

CRITERION MEASURE:

1. Receipt and expense records are filed correctly according to pre-established categories.
2. Expense and receipt data is recorded accurately.
3. Accurate summary data is provided periodically on sales and purchase records.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Set up filing system.	I. Filing system A. Sales (credit, cash, or check) B. Purchases C. Public relations D. Accounts payable E. Accounts receivable	I. Demonstrates commitment to filing records and reporting data accurately.
II. File receipts.	II. Filing receipts (procedures)	II. Accepts responsibility for mistakes.
III. Record expense and receipt data.	III. Recording data A. Item B. Date purchased or sold C. Cost D. Category in which filed	III. Volunteers to provide data at times other than at established intervals if needed.
		IV. Performs filing and recording tasks daily to avoid pileups.

OUTLINE OF INSTRUCTIONAL CONTENT (CONTINUED)

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
IV. Compute summary data from receipt and expense records.	IV. Summary data A. Expenses and expenditures 1. Date 2. Category B. Accounts payable C. Accounts receivable	

ANALYSIS

CURRICULUM: Horticulture Technology **SUBJECT AREA:** Recording

TASK: (No. M168) Prepare and mail bills to collect accounts receivable.

COMPETENCY: Prepare and mail bills to collect accounts receivable.

CRITERION MEASURE:

1. Bills are prepared on proper forms.
2. Bills are accurate with correct mailing address listed.
3. Bills are mailed at end of each month or with as little lag time as possible between purchase and billing.
4. Follow-up letters are justifiable, being specific with penalties adequately described.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Determine proper billing form for specific accounts.	I. Billing forms A. Customer B. Business	I. Keeps accounts receivable updated and promptly bills customers.
II. Determine mailing time in relation to actual sales of item.	II. Mailing times in relation to sales of merchandise A. Monthly B. Quarterly C. Bimonthly D. Semi-annually E. Annually	II. Maintains a positive and cheerful attitude toward all customers. III. Treats customers courteously at all times.
III. Prepare bills.	III. Preparing bills A. Item B. Price C. Discount with prompt payment	IV. Shows sensitivity to customers who are behind in payments because of legitimate reasons.

OUTLINE OF INSTRUCTIONAL CONTENT (CONTINUED)

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
IV. Mail bills.	IV. Mailing bills A. Name of customer B. Address and zip code C. Categorizing	
V. Prepare follow-up letters for overdue accounts.	V. Overdue accounts A. Friendly but firm letter B. Penalties	

ANALYSIS

CURRICULUM: Horticulture Technology **SUBJECT AREA:** Recording

TASK: (No. M169) Keep employee work records.

COMPETENCY: Use necessary forms for maintaining work records of employees, record data, and keep accurate files.

CRITERION MEASURE:
1. Adequate employee work record forms are used to obtain necessary information.
2. Employee attendance records are kept daily and accurately recorded on forms.
3. Employee progress records are correctly completed from information provided and filed alphabetically by employee name.
4. Work records are filed alphabetically by employee name.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Determine employee work record forms.	I. Employee work record forms A. Work attendance 1. Name 2. Address 3. Telephone number 4. Date and hours worked 5. Rate of pay B. Work progress 1. Name 2. Address 3. Telephone number 4. Work evaluation 5. Raises received 6. Employee comments 7. Additional comments	I. Exhibits honesty in keeping and maintaining employee work records. II. Records and files data accurately. III. Provides no information on employee work records except to appropriate personnel.

OUTLINE OF INSTRUCTIONAL CONTENT (CONTINUED)

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
II. Record work attendance data.	II. Recording information A. Attendance 1. Time clocks 2. Supervisor	
III. Record work progress data.	B. Work progress 1. Supervisor 2. Employee	
IV. File records alphabetically by employee name.	III. Filing information procedures A. Alphabetical listing by employee name B. Discard forms of former employees after five years	

ANALYSIS

CURRICULUM: Horticulture Technology **SUBJECT AREA:** Records

TASK: (NO. M170) Prepare employee payroll.

COMPETENCY: Obtain necessary information to prepare employee payrolls.

CRITERION MEASURE:

1. All information needed to prepare employee payrolls is obtained from appropriate forms.
2. Gross salary is accurately determined.
3. All deductions are accurately determined.
4. Net salary is accurately determined.
5. Information is recorded on forms for filing and for reporting of withheld funds to state and federal agencies.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Obtain payroll information from provided forms.	I. Payroll information A. Date information must be available B. Hours worked and rate of pay C. Overtime, bonus, or incentive pay D. Income tax forms E. Social Security forms	I. Shows responsibility in obtaining, determining, recording, and filing accurately all payroll data. II. Accepts responsbility for mistakes.
II. Figure gross salary, deducations, and net salary.	II. Determine net payment A. Gross salary B. Deductions 1. Social Security 2. Taxes (state and federal)	III. Asks questions of supervisor when data is not clear or something is not understood. IV. Practices honesty at all times.

OUTLINE OF INSTRUCTIONAL CONTENT (CONTINUED)

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
	3. Insurance 4. Other C. Net payment (gross salary minus deductions)	V. Provides payroll information only to appropriate personnel.
III. Record information and file for future reference.	III. Recording and filing information A. Gross salary B. Taxes C. Social Security D. Insurance E. Other	

ANALYSIS

CURRICULUM: Horticulture Technology **SUBJECT AREA:** Records

TASK: (No. M171) Assist in records audit.

COMPETENCY: Assists auditor by providing records and needed information for auditing purposes.

CRITERION MEASURE:

1. Records are made readily available for auditor.
2. Necessary additional computations are made and provided to auditor.
3. Necessary resources (personnel, form examples, books, etc.) are provided to the auditor.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Pull records from file.	I. Review of company records A. Sales receipts B. Business expenses C. Taxes withheld D. Workmen's compensation E. Business tax 1. Inventory tax 2. Intangible tax F. Tax shelters G. Short and long-term losses H. Accounts payable I. Accounts receivable J. Payroll K. Other	I. Voluntarily assists auditor in providing records, additional information and resources. II. Understands and accepts the role of auditors. III. Asks questions of auditor for clearer understanding of recordkeeping, especially if discrepancies are found.
II. Make additional computations.	II. Additional information A. Needed summary statements B. Missing data	IV. Shows interest in records audit and willing to learn as much as possible.

OUTLINE OF INSTRUCTIONAL CONTENT (CONTINUED)

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
	C. Incomplete data	
III. Provide additional resources to auditor.	III. Additional resources A. Answer questions B. Suggest individuals who might provide additional information C. Provide books, forms, additional work space, equipment, etc. for auditor	

ANALYSIS

CURRICULUM: Horticulture Technology **SUBJECT AREA:** Records

TASK: (No. M172) Prepare income tax and other necessary reports.

COMPETENCY: Prepare income tax forms and other necessary reports and mail to proper locations by required filing dates.

CRITERION MEASURE:
1. Income tax forms are completed accurately (state and federal).
2. Estimated tax forms, employee withholding tax forms, workman compensation forms, social security forms, and other required state and/or federal forms are completed accurately.
3. Filing dates for required forms are listed correctly.
4. All forms are mailed to correct location.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Obtain proper records.	I. Records used in preparing income tax and other forms A. Income 1. Sales 2. Interest 3. Other B. Expenses 1. Medical 2. Taxes 3. Interest 4. Depreciation 5. Supplies 6. Equipment 7. Investments 8. Gifts 9. Other C. Social security paid on employees	I. Voluntarily works in harmony with others in obtaining necessary information for income tax and other required reports. II. Completes forms correctly and accurately. III. Asks questions of appropriate agencies or individuals on areas where information is not understood. IV. Practices honesty and integrity at all times.

OUTLINE OF INSTRUCTIONAL CONTENT (CONTINUED)

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
	D. Workman's compensation paid E. Fringe benefits F. Other	V. Accepts responsibility for own mistakes.
II. Compute data required from records. III. Complete forms.	II. Completion of forms A. Read directions B. Obtain further information as needed 1. Calling 2. Writing 3. Obtaining additional required forms C. Enter data on forms and make proper calculations	
IV. Mail forms to correct locations by required filing dates.	III. Mailing forms A. Correct locations B. Correct filing dates	

ANALYSIS

CURRICULUM: Horticulture Technology

SUBJECT AREA: Records

TASK: (No. M173) Keep annual depreciation schedule.

COMPETENCY: Prepare annual depreciation schedules on equipment, buildings, etc.

CRITERION MEASURE:
1. Depreciation schedules are determined that will allow for the best tax credits or will fit the business needs best.
2. Depreciation schedules are accurately calculated.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Determine best depreciation schedule. II. Calculate depreciation schedules.	I. Determining factors A. Method which best approximates the loss in value of the asset in questions B. Ease of computation II. Depreciation methods A. Straight line B. Declining balance C. Sum-of-the-year digits III. Procedures for preparing depreciation schedules	I. Recognizes the value of using correct depreciation schedules. II. Keeps current on costs, salvage values and the average life of equipment and buildings.

OUTLINE OF INSTRUCTIONAL CONTENT (CONTINUED)

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
	D. Workman's compensation paid E. Fringe benefits F. Other	V. Accepts responsibility for own mistakes.
II. Compute data required from records. III. Complete forms.	II. Completion of forms A. Read directions B. Obtain further information as needed 1. Calling 2. Writing 3. Obtaining additional required forms C. Enter data on forms and make proper calculations	
IV. Mail forms to correct locations by required filing dates.	III. Mailing forms A. Correct locations B. Correct filing dates	

ANALYSIS

CURRICULUM: Horticulture Technology **SUBJECT AREA:** Records

TASK: (No. M173) Keep annual depreciation schedule.

COMPETENCY: Prepare annual depreciation schedules on equipment, buildings, etc.

CRITERION MEASURE:
1. Depreciation schedules are determined that will allow for the best tax credits or will fit the business needs best.
2. Depreciation schedules are accurately calculated.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Determine best depreciation schedule.	I. Determining factors A. Method which best approximates the loss in value of the asset in questions B. Ease of computation	I. Recognizes the value of using correct depreciation schedules.
II. Calculate depreciation schedules.	II. Depreciation methods A. Straight line B. Declining balance C. Sum-of-the-year digits	II. Keeps current on costs, salvage values and the average life of equipment and buildings.
	III. Procedures for preparing depreciation schedules	

ANALYSIS

CURRICULUM: Horticulture Technology **SUBJECT AREA:** Records

TASK: (No. M174) Develop customer credit records.

COMPETENCY: Develop or adapt a system of keeping accurate customer records and demonstrate how to use the system.

CRITERION MEASURE:
1. A credit record system is developed or adapted from other systems already developed.
2. The system used is simple and information is readily available.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Collect and record data.	I. Collecting credit information A. Name B. Address C. Telephone number D. Bank E. Credit established at other businesses F. Credit cards and numbers G. Credit references H. Credit rating	I. Use tact in dealing with customers. II. Treats all credit data confidentially. III. Treats customers fairly and courteously. IV. Recognizes the importance of accurate credit records.
II. Set up customer credit record system.	II. Recording credit purchases A. Items purchased B. Date C. Cost D. Date notices sent E. Payment received and date F. Uncollected amounts	

OUTLINE OF INSTRUCTIONAL CONTENT (CONTINUED)

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
	III. Credit record system A. Computer B. Categorize information by calculators and filing by customer name C. Prepare summary data on each customer periodically	

ANALYSIS

CURRICULUM: Horticulture Technology **SUBJECT AREA:** Records

TASK: (No. M175) File records and other materials.

COMPETENCY: File records and all other materials accurately using an established or accepted filing system.

CRITERION MEASURE:
1. The records are filed with 100% accuracy.
2. The filing system is simple with ease of retrieving information.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. File records and other materials.	I. Filing systems A. Alphabetical B. Subject C. Chronological D. One or more systems may be used depending on materials and records to be filed II. Determination of system best for the business	I. Voluntarily keeps filing current. II. Enjoys having neat files. III. Asks questions of supervisor when having difficulty deciding how records or materials should be filed. IV. Recognizes the importance of a well-kept filing system.

ANALYSIS

CURRICULUM: Horticulture Technology **SUBJECT AREA:** Records

TASK: (NO. M176) Develop adequate record system for ordering and restocking plants, materials, pricing, determining quantities for production and for profit analysis.

COMPETENCY: Develop or adapt a system of keeping records for ordering and restocking plants, materials, pricing, determining quantities for production and for profit analysis.

CRITERION MEASURE:

1. Plants are ordered and restocked when inventories decrease to a specified level.
2. Materials are ordered and restocked when inventories decrease to a specified level.
3. Prices of plants are periodically examined and changed as costs increase.
4. Production quantities are periodically examined and adjusted according to supply and demand.
5. Income and expenses on each enterprise engaged in are periodically examined and analyses made to determine profit or loss.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Develop plant inventory records.	I. Plant inventory records A. Type of plant and variety B. Number in stock C. Price D. Stock number E. Number sold since last reporting period	I. Demonstrates commitment to keep accurate records. II. Constantly alert to seeking better, more efficient ways to develop and maintain record system.
II. Order and restock plants.	II. Ordering plants A. Type and variety B. Company C. Price D. Number of plants E. Stock number F. Date ordered G. Expected date of delivery	III. Participates in management seminars to increase knowledge of record system.

OUTLINE OF INSTRUCTIONAL CONTENT (CONTINUED)

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
III. Develop materials inventory system.	III. Materials inventory A. Item B. Number in stock C. Stock number D. Price E. Amount or number used since last reporting period	IV. Practices cooperation with others in developing, maintaining, and analyzing records. V. Stresses the need for co-worker and subordinates to keep accurate records.
IV. Order and restock materials.	IV. Ordering materials A. Item B. Description C. Stock number D. Price E. Number ordered F. Date ordered G. Expected date of delivery	
V. Develop plant cost analysis system.	V. Plant cost analysis A. Type of plant B. Seed and/or propagation costs C. Production costs D. Marketing costs E. Comparison of costs over time	
VI. Examine costs and change prices as costs change.	VI. Production quantities A. Supply and demand factors B. Quick sale or fast turnover plants C. Slow-selling plants D. Labor requirements E. Capital requirements	

Outline of Instructional Content (Continued)

Skill/Process	Knowledge/Theory	Value/Attitude Concepts
VII. Develop production quantities schedules.	VII. Enterprise budgeting procedures A. Income B. Expenses C. Profit or loss per unit	
VIII. Develop enterprise budgeting system.		

ANALYSIS

CURRICULUM: Horticulture Technology **SUBJECT AREA:** Records

TASK: (No. M177) Keep maintenance and repair records on equipment.

COMPETENCY: Keep maintenance and repair records on equipment.

CRITERION MEASURE:
1. Maintenance and repair records on equipment are kept accurately.
2. Maintenance and repair records on equipment are filed accurately for easy reference.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Record maintenance and repair records.	I. Maintenance records A. Name of vehicle or equipment B. Date purchased C. Suggested maintenance schedule D. Maintenance performed 1. Date 2. Mechanic 3. Cost 4. Check for other maintenance or repair	I. Voluntarily reports to supervisor when maintenance should be performed. II. Enjoys keeping records accurately and neatly filed. III. Recognizes that accurate maintenance and repair records can result in longer life of equipment and thus save the company money.
II. File maintenance and repair records.	II. Repair records A. Name of vehicle or equipment B. Date purchased C. Repair required 1. Date	

OUTLINE OF INSTRUCTIONAL CONTENT (CONTINUED)

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
	2. Mechanic 3. Cost 4. Check for other maintenance or repair III. Filing records A. By category - maintenance and repair B. By vehicle or equipment name	

ANALYSIS

CURRICULUM: Horticulture Technology **SUBJECT AREA:** Inventory

TASK: (NO. N178) Keep current inventory of merchandise for sale.

COMPETENCY: Take inventory of merchandise for sale and keep inventory records current.

CRITERION MEASURE:

1. Inventory of saleable merchandise is taken periodically.
2. Inventory information is recorded neatly and accurately.
3. Inventory records for pricing, sales, and business transactions are filed and available for future reference.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Take inventory.	I. Inventory techniques and procedures A. Invoices B. Record number of unsold stock	I. Realizes the need for current business records.
II. Record inventory information.	II. Basic business recordkeeping and filing system	
III. File and store information.	III. Record storage procedures	

ANALYSIS

CURRICULUM: Horticulture Technology **SUBJECT AREA:** Inventory

TASK: (NO. N179) Check received merchandise against invoice listings.

COMPETENCY: Check received merchandise against invoice listings.

CRITERION MEASURE: Invoices are read and shipment quantities and descriptions are checked against invoice listings.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Read invoices and check shipment quantities.	I. Basic business forms A. Itemized invoice B. Parcel invoice C. Other forms	I. Realizes the importances of correlated business information.
II. Compare received merchandise to invoice listings.	II. Merchandise listings A. Item description B. Cross-referencing C. Price D. Other	II. Appreciates the need for checking quantities in a shipment.
III. File invoices.	III. Filing procedures	III. Determines the usefulness of business records.

ANALYSIS

CURRICULUM: Horticulture Technology **SUBJECT AREA:** Inventory

TASK: (No. N180) Check invoices for errors.

COMPETENCY: Check invoices for errors.

CRITERION MEASURE:
1. Invoices are read and items cross-referenced for accuracy.
2. Numbers received and numbers listed are calculated and corrections made.
3. Shippers and manufacturers are contacted about discrepancies.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Read invoice and cross-reference items.	I. Basic business forms A. Itemized invoice B. Parcel invoice C. Other forms	I. Understands the need for business records.
II. Calculate numbers received vs. listed.	II. Basic business math A. Principles B. Techniques	II. Realizes the need for correction of business records for future decisions.
III. Note errors.	III. Merchandise listings A. Item description B. Price C. Amount D. Cross-referencing E. Other	III. Appreciates the importance of up-to-date records for successful business operation.

OUTLINE OF INSTRUCTIONAL CONTENT (CONTINUED)

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
IV. Contact shipper and manufacturer about discrepancies.	IV. Procedures for contacting shippers and manufacturers	

ANALYSIS

CURRICULUM: Horticulture Technology **SUBJECT AREA:** Inventory

TASK: (No. N181 **)** Store received merchandise.

COMPETENCY: Store received merchandise.

CRITERION MEASURE: Received merchandise is stored in an orderly and functional manner without damage.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Store merchandise.	I. Factors involved in storage of merchandise A. Type B. Size C. Use D. Availability II. Storage procedures	I. Realizes that easy access to merchandise improves the efficiency of the business.

ANALYSIS

CURRICULUM: Horticulture Technology
SUBJECT AREA: Inventory
TASK: (No. N182) Order replacement and/or new merchandise.
COMPETENCY: Order replacement and/or new merchandise.

CRITERION MEASURE:
1. Merchandise needs are analyzed.
2. Catalogs and sales lists are used for obtaining correct prices and order numbers.
3. Order forms are filled out and submitted or telephone requests are made to manufacturer or distributor.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Analyze merchandise needs. II. Use catalogs and sales lists. III. Order merchandise by mail or phone.	I. Merchandise A. Quantity on hand B. Delivery time requirements C. Costs D. Availability E. Turnover rate	I. Completes ordering information accurately and efficiently.

ANALYSIS

CURRICULUM: Horticulture Technology

SUBJECT AREA: Inventory

TASK: (No. N183) Arrange for transportation of materials purchased.

COMPETENCY: Arrange for transportation of materials purchased.

CRITERION MEASURE:
1. Appropriate mode of transportation is selected for various types of materials.
2. Transportation arrangements are made with shipper.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Select mode or transportation.	I. Transportation types (characteristics and costs) A. Semi-rig B. Van C. Car D. Parcel post E. Air delivery F. Rail	I. Demonstrates commitment in arranging the type of transportation that is best suited for the materials ordered.
II. Arrange for transportation of materials.	II. Fitting materials to transportation types A. Plants 1. Bedding plants 2. Potted plants 3. Foliage 4. Ornamentals a. Trees	

OUTLINE OF INSTRUCTIONAL CONTENT (CONTINUED)

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
	b. Shrubs C. Groundcovers B. Pots C. Media D. Chemicals E. Fertilizer F. Tools III. Procedures for making transportation arrangements with shipper	

ANALYSIS

CURRICULUM: Horticulture Technology **SUBJECT AREA:** Inventory

TASK: (No. N184) Order repair parts for business vehicles and equipment.

COMPETENCY: Order repair parts for business vehicles and equipment.

CRITERION MEASURE:
1. Repair parts' needs are analyzed.
2. Catalogs and sales lists are used for obtaining correct prices and order numbers.
3. Order forms are filled out and submitted or telephone requests are made to manufacturer or distributor.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Analyze needs.	I. Repair parts A. Quantity on hand B. Delivery time requirements C. Breakdown frequency D. Costs E. Availability	I. Realizes the importance of accuracy in ordering parts.
II. Use catalogs and sales lists.	II. Ordering techniques A. Written forms B. Telephone requests	II. Displays courtesy when ordering parts by phone.
III. Order repair parts by mail or phone.	III. Procedures for completing forms and submitting to manufacturer or distributor	

ANALYSIS

CURRICULUM: Horticulture Technology **SUBJECT AREA:** Management

TASK: (NO. 0185) Identify labor needs.

COMPETENCY: Identify labor needs for landscape and/or greenhouse work.

CRITERION MEASURE: Labor needs are estimated accurately for landscape and greenhouse operations.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Analyze landscape and greenhouse operations.	I. Factors concerning labor requirements for greenhouse and landscape operations A. Type of operation B. Equipment C. Size D. Location of jobs E. Seasonal requirements	I. Uses objective approach in problem solving.
II. Determine number of workers required to carry out operations.	II. Procedures for estimating labor requirements	II. Questions business operations to identify needs.
		III. Identifies resources that assist in analyzing operations.

ANALYSIS

CURRICULUM: Horticulture Technology **SUBJECT AREA:** Management

TASK: (NO. 0186) Determine kinds and amounts of equipment to buy and stock.

COMPETENCY: Identify equipment and supply needs and determine types and quantities to buy and stock.

CRITERION MEASURE:
1. Equipment and supply needs are identified for selected business operations.
2. Types and quantities of equipment and supplies to buy and stock are determined based on present and future needs.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Analyze business operations. II. Identify equipment and supply needs. III. Determines types and quantities of equipment and supplies to buy and stock.	I. Factors related to selecting and purchasing equipment and supplies A. Type of business operations presently engaged in B. Anticipated expansion C. Equipment and supplies currently available including useage and condition D. Rental of equipment E. Buying used versus new equipment	I. Recognizes the need for balance between the types of business operations engaged in and equipment and supply needs. II. Performs analysis of equipment and supply needs for making decisions.

ANALYSIS

CURRICULUM: Horticulture Technology SUBJECT AREA: Management

TASK: (No. 0187) Identify and select producers and suppliers of plants, equipment, supplies, etc.

COMPETENCY: Identify and select producers and suppliers of plants, equipment, supplies, etc.

CRITERION MEASURE:
1. Producers and suppliers are identified by appropriate methods.
2. Producers and suppliers are selected based on reputable sources of information.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Identify producers and suppliers. A. Customers B. Sales catalogs C. Competitors D. Magazines E. Journals F. Sales representatives II. Select producers and suppliers A. Contact Better Business Bureau B. Ask competitors, customers, etc. C. Try products on trial basis	I. Selecting producers and suppliers A. Location B. Transportation C. Costs D. Availability E. Quality F. Reputation G. Honesty H. Service	I. Recognizes the need for selecting producers and suppliers who have a reputation of honesty and good service.

ANALYSIS

CURRICULUM: Horticulture Technology **SUBJECT AREA:** Management

TASK: (No. 0188) Select and purchase equipment, supplies, etc.

COMPETENCY: Identify equipment and supply needs and determine types and quantities to buy and stock.

CRITERION MEASURE:

1. Equipment and supply needs are identified for selected business operations.
2. Types and quantities of equipment and supplies to buy and stock are determined based on present and future needs.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Analyze business operations. II. Identify equipment and supply needs. III. Determines types and quantities of equipment and supplies to buy and stock.	I. Factors related to selecting and purchasing equipment and supplies A. Type of business operations presently engaged in B. Anticipated expansion C. Equipment and supplies currently available including useage and condition D. Rental of equipment E. Buying used versus new equipment	I. Recognizes the need for balance between the types of business operations engaged in and equipment and supply needs. II. Performs analysis of equipment and supply needs before making decisions.

ANALYSIS

CURRICULUM: Horticulture Technology **SUBJECT AREA:** Management

TASK: (No. 0189) Enforce safety regulations

COMPETENCY: Enforce safety regulations through seminars or workshops with supervisors and/or employees.

CRITERION MEASURE:

1. Supervisors and/or employees are periodically checked to determine if they are following safety precautions with irregularities found reported in written form.
2. Supervisors and/or employees are supervised daily to encourage safety consciousness.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Read and attend workshops on OSHA regulations.	I. Safety factors concerning equipment operation, repair and maintenance	I. Values the importance of safety from standpoint of employees and customers.
II. Read and provide supervisor's and/or employees with equipment manuals emphasizing safety aspects.	II. Handling, applying, and storage of chemicals	II. Displays safety consciousness at all times.
III. Prepare and hold workshops with supervisors and/or employees on safety.	III. Safety factors A. Owner's manuals B. OSHA C. Safety publications D. Periodic checks E. Employee supervision	III. Attends workshops and seminars on new safety regulations and practices.
IV. Build proper facility for storing chemicals.		
V. Reprimand supervisors and/or employees who do not abide by safety regulations.		

ANALYSIS

CURRICULUM: Horticulture Technology **SUBJECT AREA:** Management

TASK: (No. 0190) Recruit and select employees.

COMPETENCY: Recruit, interview, and select employees based on needed qualifications.

CRITERION MEASURE:
1. Employee positions are advertised by legal and ethical methods.
2. Prospective employees are interviewed using accepted interviewing techniques.
3. Employees are selected for positions based on needed qualifications.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Advertise employee positions.	I. Advertising methods A. Newspaper B. Radio C. Television D. Magazines E. Journals F. Word-of-mouth	I. Values honesty, integrity and fairness in advertising for employees and in making employee selections.
II. Interview prospective employees.	II. Interviewing techniques	
III. Select employees.	III. Employment of selective applications A. Qualifications B. Salary C. Job requirements D. Fringe benefits	

ANALYSIS

CURRICULUM: Horticulture Technology **SUBJECT AREA:** Management

TASK: (No. 0191) Train employees.

COMPETENCY: Set up a training program for new employees and an ongoing inservice program.

CRITERION MEASURE:
1. A thorough and effective training program is developed for training new employees for selective jobs.
2. An ongoing inservice program is developed for keeping all employees current and motivated.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Develop a new employee training program. A. Introduce the employee to other employees. B. Provide a complete tour of the business, outlining the different operations. C. Assign specific responsibilities and supervisor(s). D. Orient the employee about specific company policies, procedures, and regulations. E. Hold periodic meetings on various topics for all new employees during first year of employment.	I. Employee inservice programs A. Resource materials 1. Magazine articles 2. Journal articles 3. Horticulture Association publications 4. University extension publications B. Resource persons C. Group processes D. Motivational techniques E. Other II. Procedures for setting up and operating new employee training programs	I. Realizes the importance of good, ongoing inservice programs. II. Demonstrates a commitment to each employee to help him/her do his/her best.

OUTLINE OF INSTRUCTIONAL CONTENT (CONTINUED)

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
II. Set up ongoing employee in-service program. A. Hold regularly scheduled meetings for information on topics of need and interest. B. Hold periodic meetings for employees to offer suggestions and bring up things that are bothering them. C. Provide employees with opportunities to attend workshops, conferences, and horticulture association meetings.	III. Procedures for providing ongoing inservice programs for all employees	

ANALYSIS

CURRICULUM: Horticulture Technology **SUBJECT AREA:** Management

TASK: (No. 0192) Designate employee work assignments.

COMPETENCY: Designate employee work assignments.

CRITERION MEASURE: Selected job requirements are defined and employee skills and expertise are matched to work requirements.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Define job requirements.	I. Job requirements A. Skills B. Knowledge C. Attitudes	I. Assigns jobs to employees fairly and objectively.
II. Match employee skills and expertise to job requirements.	II. Employee characteristics A. Strengths B. Weaknesses C. Interests D. Areas of experience and educational background	II. Sensitive to employees' interests and needs.

Appendix

ANALYSIS

CURRICULUM: Horticulture Technology **SUBJECT AREA:** Management

TASK: (No. 0193) Supervise employees.

COMPETENCY: Supervise employees to improve their performance, job satisfaction, and provide safe work conditions.

CRITERION MEASURE: Employees are properly supervised for quality, efficiency, and safe work habits.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Improve work performance of employees.	I. Principles of supervision A. Theories B. Work situation C. Employee characteristics	I. Shows sensitivity to human needs and employee problems.
II. Provide safe working conditions.	II. Employment objectives A. Quality B. Quantity C. Safety D. Efficiency E. Employee moral	II. Displays safety consciousness.
III. Improve employee morale and job satisfaction.		III. Displays honesty and integrity to each employee.
		IV. Listens attentively.
		V. Demonstrates industry, punctuality, and self-discipline.

ANALYSIS

CURRICULUM: Horticulture Technology **SUBJECT AREA:** Management

TASK: (No. 0194) Evaluate employee performance.

COMPETENCY: Develop evaluation procedure and objectively evaluate employee performance.

CRITERION MEASURE:

1. An evaluation procedure is developed that is practical, objective, and fair, and meets the needs of the business operation.
2. Employee performance is objectively evaluated based on the established criteria for the job and utilizing the developed evaluation procedure.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Determine types of evaluation procedures used in horticulture and other related areas. II. Analyze business operation to determine appropriate evaluation procedure. III. Evaluate employees based on established job criteria and utilizing the evaluation procedure.	I. Research techniques for determining procedures A. ERIC B. Library C. Other 1. Magazine articles 2. Journal articles 3. Survey of other businesses 4. Consultants D. Workshops and seminars II. Development of evaluation procedure A. Business operation B. Employee characteristics, needs, and desires	I. Uses objective approach in developing and implementing evaluation procedures. II. Practices honesty and integrity. III. Understands and accepts his/her own strengths and limitations.

OUTLINE OF INSTRUCTIONAL CONTENT (CONTINUED)

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
	C. Owner and/or administration characteristics and desires D. Procedures used in similar business operations III. Employee evaluation A. Counseling techniques B. Interviewing techniques C. Legal requirements	

ANALYSIS

CURRICULUM: Horticulture Technology

SUBJECT AREA: Management

TASK: (No. 0195) Perform personnel actions such as promoting, firing, disciplinary actions, etc.

COMPETENCY: Establish personnel regulations and perform personnel actions such as promoting, firing, disciplinary action, etc.

CRITERION MEASURE:
1. Personnel regulations are established that are practical and meet the needs of the business operation.
2. Personnel actions are performed as indicated in the personnel regulations or as situations demand.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Determine types of personnel regulations used in horticulture and other businesses.	I. Research techniques for determining personnel regulations A. ERIC B. Library C. Other 1. Current magazine and journal articles 2. Survey of other businesses 3. Consultants 4. Workshops and seminars	I. Demonstrates beliefs in the democratic process.
II. Analyze the business operation to determine appropriate personnel regulations.	II. Development of personnel regulations A. Business operation (history, policies, etc.) B. Employee characteristics, needs, and desires	II. Shows concern for the welfare of others.
III. Review personnel actions and make decisions on promotion, firing, disciplinary action, etc.		III. Recognizes the value of honesty, integrity, and objectivity.

OUTLINE OF INSTRUCTIONAL CONTENT (CONTINUED)

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
	C. Owner and/or administration characteristics and desires D. Regulations used in similar business operations III. Personnel actions A. Legal implications B. Employee rights and responsibilities	

ANALYSIS

CURRICULUM: Horticulture Technology **SUBJECT AREA:** Management

TASK: (No. 0196) Establish employee wages, hours, and working conditions.

COMPETENCY: Establish employee wages, hours, and working conditions.

CRITERION MEASURE:

1. Employee wages, hours, and working conditions are established for specific job situations that are practical.
2. An appropriate (daily, weekly, monthly) work schedule is developed for employee work assignments.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Determine wages, hours, and working conditions of employees in other horticulture enterprises and related businesses. II. Analyze the business operation to determine appropriate employee wages, hours, working conditions, and assignments.	I. Research techniques for determining wages, hours, working conditions A. ERIC B. Library C. Other 1. Current magazine and journal articles 2. Survey of other businesses 3. Consultants 4. Workshops and seminars II. Information desired A. Basic compensation 1. Regular pay 2. Holiday pay 3. Vacation pay	I. Shows awareness of the importance of fair and equitable wages, hours, working conditions, and schedules. II. Sensitive to employee needs and desires. III. Displays honesty and integrity in all relationships. IV. Shows concern for the welfare of others.

OUTLINE OF INSTRUCTIONAL CONTENT (CONTINUED)

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
	B. Overtime pay C. Bonuses D. Social security E. Insurance F. Disability income G. Workman's compensation H. Working hours I. Type of work J. Work schedules K. Work conditions III. Development of employee wages. hours, working conditions, and schedules A. Business operation (type, policies, etc.) B. Employee characteristics, needs, desires, etc. C. Owner and/or administration characteristics and desires D. Regulations used in similar business operations E. Legal requirements	

ANALYSIS

CURRICULUM: Horticulture Technology **SUBJECT AREA:** Management

TASK: (No. 0197) Administer social security and other employee benefit programs.

COMPETENCY: Administer social security and other employee benefit programs.

CRITERION MEASURE:
1. Appropriate agencies and companies are contacted about employee benefit programs.
2. Benefit programs are thoroughly explained to employees.
3. Appropriate forms are correctly completed and submitted to agencies and companies.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Communicate with agencies and companies underwriting employee benefit programs. II. Explain benefit programs to employees. III. Complete and submit forms.	I. Communication skills A. Business letters B. Telephone etiquette C. Group processes D. Forms II. Information sources A. Social security administration (local, state, federal) B. Insurance companies C. Lawyers D. State government 1. Attorney general 2. Department of Labor E. Workshops, conferences	I. Realizes the importance of complying with legal regulations. II. Demonstrates commitment to social improvement. III. Proposes benefit programs that are for the good of employees. IV. Attends workshops and seminars.

OUTLINE OF INSTRUCTIONAL CONTENT (CONTINUED)

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
	III. Procedures for administering social security and other benefit programs	

ANALYSIS

CURRICULUM: Horticulture Technology **SUBJECT AREA:** Management

TASK: (No. 0198) Knowledge of business laws, taxes and laws pertaining to hiring, paying and treatment of employees.

COMPETENCY: Apply business laws, tax laws and laws pertaining to hiring, paying and treatment of employees to the business operation.

CRITERION MEASURE:

1. The business operation is complying with all business laws concerning development, expansion and the daily operation of the business.
2. All tax laws concerning the business operation are being complied with.
3. All laws concerning the hiring, paying and treating of employees are being complied with.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Obtain information concerning all laws affecting the business and maintain a current working file of these laws.	I. Information sources A. Practical business law books B. Short courses, seminars, and conferences C. Lawyers D. Horticulture associations E. Publications F. Local, state, and federal government agencies G. Copies of laws affecting small businesses	I. Shows respect for laws.
II. Keep as current as possible on all laws pertaining to the business.	II. Knowledge of basic laws	II. Obtains as much useful information as possible about laws by reading, attending meetings, seminars, etc.
III. Consult lawyers or other legal aids for information on laws that are not clear or that are not understood.	III. Procedures for hiring lawyers for legal advice and counsel	III. Questions authorities about laws that are not understood.

ANALYSIS

CURRICULUM: Horticulture Technology **SUBJECT AREA:** Management

TASK: (No.0199) Analyze new products and plants to determine if they need to be added to the sales lines.

COMPETENCY: Determine if new products and plants need to be added to the sales lines.

CRITERION MEASURE:

1. An experimental sales plan is designed for new products and plants to assist in making decisions on what should be added to the sales line.
2. New products and plants that are selected for sales lines maintain an investment compared to other sales items over a specified period of time.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Obtain information on experimental sales plans.	I. Information sources A. Survey other businesses B. Reference materials (books, magazines, journals, research publications) C. Consultants D. Horticulture associations E. Conferences, seminars, courses	I. Recognizes the need for systematic planning.
II. Analyze the business operation and develop or adopt a sales plan appropriate for the business.	II. Business analysis A. Products sold over a specified period of time B. Demand for new products or plants C. Average profit on various products sold	II. Demonstrates problem-solving attitudes.
III. Gather data over a period of time, summarize it and make a final decision concerning the addition of the item(s) to the sales line.		III. Enjoys a challenge of developing difficult plans and making decision.

OUTLINE OF INSTRUCTIONAL CONTENT (CONTINUED)

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
	D. Competition for products currently sold	
	III. Experimental sales plans	
	A. Time period	
	B. Products	
	C. Sales volume	
	D. Increased number of customers because of new products	
	E. Change in sales volume of other products	
	F. Average profit for new products	

ANALYSIS

CURRICULUM: Horticulture Technology **SUBJECT AREA:** Management

TASK: (No. 0200) Analyze current market trends and expansion possibilities.

COMPETENCY: Obtain the needed information to analyze current market trends and expansion possibilities.

CRITERION MEASURE: Current market trends are identified and analysis made based on available information concerning possible expansion of product lines.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Obtain information on market trends. II. Identify market trends based on current information. III. Examine business operation and analyze expansion possibilities.	I. Information sources A. Consultants B. Reference materials (books, magazines, journals, courses, research publications, forecasts, statistical reports) C. Horticulture associations D. Conferences, seminars, courses II. Business analysis A. Analysis of business records B. Changes over time periods C. Relate industry trends to trends of the business	I. Realizes the importance of accurate information. II. Makes careful analysis of the available data.

ANALYSIS

CURRICULUM: Horticulture Technology **SUBJECT AREA:** Management

TASK: (No. 0201) Determine need for, select reputable insurer, and purchase comprehensive business insurance.

COMPETENCY: Determine the need for business insurance, select a reputable insurance company, and purchase comprehensive business insurance.

CRITERION MEASURE:
1. Appropriate insurance needs are identified for selected business operations.
2. Reputable insurance company is selected and appropriate types and amounts of insurance is purchased to cover identified risks.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Identify insurance needs by analyzing the business operations.	I. Business insurance needs A. Types of operation B. Employees C. Equipment D. Management value E. Overhead F. Debt G. Business expenses H. Profit margin I. Current insurance J. Estimated funds available for additional insurance	I. Realizes the importance of insurance to cover business risks.
II. Obtain information on insurance companies and select reputable insurer and one that can give the types of protection needed.	II. Insurance information A. Better Business Bureau B. Customers, competitors C. Lawyers and other legal aides D. Investigators and consultants	II. Consults with reputable individuals who can provide valuable information about insurance needs and good companies.
III. Purchase types and amounts of insurance to cover identified risks.		III. Attends conferences and other meetings to obtain needed information.

OUTLINE OF INSTRUCTIONAL CONTENT (CONTINUED)

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
	E. References F. Seminars, courses, conferences III. Procedures for analysing information, selecting reputable insurance company, and purchasing kinds and amounts of insurance needed	

ANALYSIS

CURRICULUM: Horticulture Technology **SUBJECT AREA:** Management

TASK: (No.0202) Estimate costs of projects and make proper bids.

COMPETENCY: Analyze component parts of projects, estimate costs of each component, and submit proper bids.

CRITERION MEASURE:
1. Costs for selected projects are accurately estimated based on project analysis.
2. Bids are properly submitted on prepared forms or in an acceptable format.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Read and interpret project plans and specifications. II. Make a site analysis. III. Analyze component parts of the project and estimate costs on each part. IV. Compute total cost of project. V. Complete bid forms or formats and submit to specified individual or firm.	I. Project analysis procedures A. Plans and specifications B. Site analysis C. Costs and pricing 1. Materials 2. Equipment 3. Labor 4. Transportation 5. General overhead 6. Other job costs (i.e. utilities, scheduling) 7. Mark-ups 8. Bonds 9. Insurance 10. Miscellaneous II. Procedures for completing and submitting forms to contractor	I. Realizes the importance of accurately estimating costs. II. Keeps current on costs by keeping good records and keeping abreast of price changes.

ANALYSIS

CURRICULUM: Horticulture Technology **SUBJECT AREA:**Management

TASK: (No. 0203)Carry out or implement landscape design plans.

COMPETENCY: Install landscape design from a prepared plan.

CRITERION MEASURE:
1. Landscape design plans are correctly read and interpreted.
2. A designated landscape site is properly prepared.
3. Plants and construction specifications are properly installed.
4. The landscape job is cleaned up and inspected for accuracy.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Read and interpret landscape design plans.	I. Reading and interpreting landscape design plans	I. Follows prepared landscape design plans closely.
II. Prepare the site.	II. Operation of equipment for preparing site	II. Performs tasks using accepted horticultural practices.
III. Install plants.	III. Installation of plants using appropriate techniques	III. Answers clients' questions promptly and courteously.
IV. Install construction specifications.	IV. Construction of walks, drives, walls, planters, etc. according to plan specifications using appropriate equipment	IV. Selects healthy plants for jobs.
V. Inspect job.	V. Inspection requirements	V. Accepts responsbility for mistakes.
VI. Clean up area.		

ANALYSIS

CURRICULUM: Horticulture Technology **SUBJECT AREA:** Management

TASK: (No. 0204) Determine appropriate plant replacements if specified plants are not available in landscape plan.

COMPETENCY: Select appropriate plant replacements when specified plants are not available.

CRITERION MEASURE: Plant substitutes are chosen that create the same or very similar results that were desired for the specified plants in the plan.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Identify plants that have similar growth habits and characteristics and require similar cultural practices.	I. Plant identification A. Names (common and scientific) B. Cultural requirements C. Growth habits and characteristics D. Flowering habits	I. Obtains materials on plants that assist in making decisions on substitutions.
II. Select appropriate plant substitutes.	II. Basic design principles	II. Shows interest in learning as much about plant materials as possible.
	III. Sources of alternative plants	

ANALYSIS

CURRICULUM: Horticulture Technology **SUBJECT AREA:** Management

TASK: (No.0205) Determine business credit needs.

COMPETENCY: Analyze the business assets, liabilities, expansion plans, profits and current credit and determine additional credit needs.

CRITERION MEASURE:

1. Business assets are correctly identified.
2. Business liabilities are correctly identified.
3. Profits are correctly calculated.
4. Current credit use is correctly determined.
5. Projections for additional credit needs are determined based on identified financial situations and expansion plans.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Review and and analyze all financial records.	I. Financial records and record-keeping	I. Realizes the importance of credit and good credit rating in business operations.
II. Compute profits, losses, net worth, financial obligations.	II. Current credit obligations	II. Demonstrates problem-solving attitudes.
III. Calculate additional credit needs.	III. Types of credit and payment alternatives	III. Works cooperatively with others in obtaining and verifying information.
	IV. Basic math computations and simple formulas	

ANALYSIS

CURRICULUM: Horticulture Technology

SUBJECT AREA: Management

TASK: (No.0206) Locate sources of and secure credit.

COMPETENCY: Identify credit sources, analyze alternative choices and secure the type of credit best suited for the business.

CRITERION MEASURE:

1. Credit sources are correctly identified.
2. Types of credit and alternative payment plans are correctly determined and analyzed.
3. Credit is chosen that best fits the business situation.
4. Application forms are correctly completed and final transactions made.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Locate credit sources. II. Determine types of credit available and alternative payment plans. III. Analyze the business operation to determine the type or types of credit that are most appropriate. IV. Choose the credit type(s). V. Complete application forms, make final transactions, and secure credit.	I. Determining credit sources A. Lawyers B. Horticulture assocations C. Reference materials D. Conferences, meetings E. Friends F. Business associates G. Competitors H. Yellow pages of phone book II. Types of credit and alternative payment plans III. Legal implications and responsibilities IV. Analysis of business needs	I. Listens to advice given about credit from lawyers and other reputable sources. II. Studies types of credit and business needs and makes objective decisions based on best information available.

OUTLINE OF INSTRUCTIONAL CONTENT (CONTINUED)

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
	V. Credit application forms	
	VI. Procedures for securing types of credit needed	

ANALYSIS

CURRICULUM: Horticulture Technology **SUBJECT AREA:** Management

TASK: (No. 0207) Prepare, negotiate, and implement sales contracts.

COMPETENCY: Prepare, negotiate, and implement sales contracts.

CRITERION MEASURE:
1. Sales contracts are correctly prepared and negotiated.
2. The implementation phase of sales contracts is correctly carried out.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Analyze business to determine products available for contract sales.	I. Analysis of business operations	I. Demonstrates a commitment to improvement of the business through possible sales contracts.
II. Consult with lawyer or legal experts to draw up sales contracts.	II. Sales contracts A. Types B. Preparation methods	II. Displays courtesy and respect to customers.
III. Negotiate contracts with potential customers.	III. Attorney consultations	III. Shows willingness to obtain and provide lawyers with needed information for making contractual agreements.
IV. Implement sales contracts.	IV. Negotiation methods	IV. Accepts full responsibility for meeting the provisions of the contract.
	V. Implementation procedures	

ANALYSIS

CURRICULUM: Horticulture Technology **SUBJECT AREA:** Management

TASK: (No. 0208) Allocate monies in preparing budget.

COMPETENCY: Develop a budget for a fiscal year for a business based on past financial records and current information.

CRITERION MEASURE:

1. Financial records of the business are analyzed and appropriate computations made for making decisions on allocation of monies.
2. Budgeting methods are identified and procedures outlined.
3. The type of budget is chosen that best fits the business operation.
4. Budget forms and entries are identified.
5. A budget is prepared based on priorities and financial records.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Analyze financial records of the business and compare past budgets with actual expenditures.	I. Analysis of financial records A. Past budgets B. Actual allocation of monies C. Areas of high, low, and average expenditures and income	I. Practices cooperation in group activities.
II. Work with other key individuals in the business to set priorities.	II. Budgeting methods and procedures	II. Performs analyses accurately and efficiently.
III. Determine the type of budget to use.	III. Determining priorities A. Past records B. Future plans and expansions C. Trends of the business and the total industry	III. Discusses priorities openly and with information adequately prepared.
IV. Prepare the budget using accumulated records and priorities that have been set.	IV. Budgeting procedures	IV. Completes budget assignments promptly and accurately.
		V. Uses consultants whenever necessary to assist in budgeting.

Appendix

ANALYSIS

CURRICULUM: Horticulture Technology **SUBJECT AREA:** Management

TASK: (No. 0209) Analyze business enterprises on cost and return basis.

COMPETENCY: Compute net profit of business plus profits on separate enterprises of the business.

CRITERION MEASURE:

1. Business costs and returns are identified.
2. Net profits are correctly computed on the total business and also on separate enterprises.
3. Ratio of costs and returns are correctly computed on the entire business and on separate enterprises.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Identify business costs.	I. Analysis of financial records to determine costs and returns	I. Makes computations accurately.
II. Identify business returns.	II. Basic mathematical computations to determine net profits and ratios of costs and returns	II. Realizes the need and importance of knowing net profits or losses for the business and separate enterprises.
III. Compute net profits on total business and on separate enterprises.	III. Methods of determining costs and income	
IV. Compute ratio of costs and returns.	IV. Procedures for computing profits on separate enterprises and on total business	

Appendix

ANALYSIS

CURRICULUM: Horticulture Technology **SUBJECT AREA:** Management

TASK: (No. 0210) Arrange trade-ins and credit terms.

COMPETENCY: Appraise equipment and materials, negotiate trade-ins and arrange credit terms.

CRITERION MEASURE:
1. Horticulture equipment and materials are appraised accurately.
2. Trade-ins are negotiated courteously, efficiently, and fairly.
3. Credit terms for total trade-in price and purchases are correctly arranged and computed.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Appraise horticultural equipment and materials.	I. Value of horticultural equipment and materials	I. Realizes the value of credit for the business operation.
II. Negotiate trade-ins.	II. Negotiation techniques	II. Establishes good rapport with customers.
III. Arrange and compute credit terms.	III. Credit A. Sources B. Types C. Terms D. Rates E. Legal aspects	
	IV. Procedures for negotiating trade-ins and arranging credit terms	

ANALYSIS

CURRICULUM: Horticulture Technology **SUBJECT AREA:** Management

TASK: (No. 0211) Check credit references of customers.

COMPETENCY: Check credit references of customers.

CRITERION MEASURE:
1. Credit references of customers are correctly identified.
2. Credit bureaus are identified and their services used correctly.
3. Appropriate credit reference inquiries are made.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Obtain credit references from customers. II. Check credit references by using credit bureaus and direct inquiries.	I. Use of credit application forms A. Personal information B. Credit references C. Brief financial summary II. Credit references (methods of checking) A. Credit bureaus B. Banks C. Creditors D. Personal references	I. Handles credit inquiries courteously and efficiently. II. Shows interest in providing good customers with credit. III. Builds good rapport with customers and treats them fairly.

ANALYSIS

CURRICULUM: Horticulture Technology

SUBJECT AREA: Designing a Landscape

TASK: (No. P212) Identify and use drafting equipment.

COMPETENCY: Correctly identify drafting equipment and use drafting equipment to make simple drawings neatly and accurately.

CRITERION MEASURE:
1. Drafting equipment is correctly identified.
2. Drafting equipment is used correctly to make drawings neatly and accurately.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Identify drafting equipment.	I. Drafting equipment (identification and use) A. Table B. T-square C. Triangles D. Templates E. Compass F. Paper G. Pens, pencils, rapidograph H. Curves	I. Participates willingly in activities designed to identify drafting equipment. II. Appreciates the importance of neatness and accuracy. III. Practices using drawing equipment on own time.
II. Use drafting equipment to make simple drawings.	II. Drafting techniques and procedures	

ANALYSIS

CURRICULUM:	Horticulture Technology	SUBJECT AREA:	Designing a Landscape
TASK: (No. P213)	Develop knowledge of landscape symbols.		
COMPETENCY:	Correctly identify landscape design symbols.		
CRITERION MEASURE:	Landscape design symbols are correctly identified.		

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Identify landscape design symbols.	I. Identification of design symbols A. Deciduous trees B. Evergreen trees C. Shrubs D. Hedges E. Groundcovers F. Lawns G. Flower beds H. Existing plants I. Proposed plants J. Artifacts	I. Appreciates the use and simplicity of landscape symbols.

ANALYSIS

CURRICULUM: Horticulture Technology

SUBJECT AREA: Designing a Landscape

TASK: (No. P214) Key and letter a drawing.

COMPETENCY: Correctly key and letter drawings.

CRITERION MEASURE:
1. Drawings are correctly and clearly keyed.
2. Drawings are correctly and neatly lettered.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Key drawings.	I. Keying A. Plant names B. Numbers C. Letters D. Miscellaneous	I. Appreciates neatness and accuracy in keying and lettering drawings.
II. Letter drawings	II. Lettering methods A. Free hand B. Lettering guides	

ANALYSIS

CURRICULUM: Horticulture Technology

SUBJECT AREA: Designing a Landscape

TASK: (No. P215) Consult with client to determine his needs and wishes.

COMPETENCY: Determine the type or extensiveness of the landscape design needed or desired from clients.

CRITERION MEASURE:

1. Clients are consulted using courtesy and respect.
2. Appropriate questions are asked clients to determine their needs and wishes.
3. Written check-off lists are administered to clients and the lists are analyzed to determine needs and desires.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Consult with client to determine needs and wishes.	I. Consultation A. Conference B. Questionnaire C. Check-off Lists 1. Activities a. Entertaining b. Cooking c. Games d. Playing e. Swimming f. Gardening g. Birdwatching h. Pets i. Laundry j. Storage k. Other 2. Desired plants 3. Cost Limits	I. Develops an appreciation for courteousness to clients. II. Demonstrates problem-solving attitudes. III. Accepts the client's point of view but makes constructive suggestions and recommendations as needed.

ANALYSIS

CURRICULUM: Horticulture Technology

SUBJECT AREA: Designing a Landscape

TASK: (No. P216) Survey the landscape area.

COMPETENCY: Survey the area to be landscaped to determine dimensions, locate landscape features and determine where plants are needed.

CRITERION MEASURE:
1. The dimensions of the landscape area are correctly determined.
2. The landscape features are correctly located.
3. Locations where plants are needed are determined.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Survey the landscape area. A. Determine dimensions B. Locate landscape features C. Determine where plants are needed	I. Surveying procedures A. Equipment use and techniques 1. Transit 2. Tripod 3. Rod B. Measuring distances C. Locating landscape features 1. Reading blueprints 2. Marking area where features are located 3. Artifacts 4. Property lines 5. Utility lines (electricity, water, sewer, etc.) 6. Existing plants 7. Proposed plants 8. Other	I. Recognizes the need to perform surveying tasks accurately.
		II. Practices surveying techniques to become proficient and accurate.

ANALYSIS

CURRICULUM: Horticulture Technology **SUBJECT AREA:** Designing a Landscape

TASK: (No. P217) Locate existing water and sewer lines in landscape areas.

COMPETENCY: Locate existing water and sewer lines in landscape areas.

CRITERION MEASURE: Blueprints are read and interpreted correctly to locate existing water and sewer lines.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Read and interpret blueprints.	I. Procedures for reading and interpreting blueprints	I. Realizes the importance of locating existing water and sewer lines.

ANALYSIS

CURRICULUM: Horticulture Technology

SUBJECT AREA: Designing a Landscape

TASK: (No. P218) Develop landscape design by using principles and techniques that fit the job.

COMPETENCY: Prepare a landscape design that fits the situation.

CRITERION MEASURE:
1. The prepared design is neat, accurate and practical for the situation.
2. Plants are selected that are available in the region and are suited for the selected site.
3. The design exhibits unity and balance.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Develop a landscape design.	I. Developing landscape designs A. Principles 1. Unity 2. Balance 3. Accent 4. Focalization 5. Scale 6. Proportion 7. Harmony 8. Rhythm 9. Repetition B. Techniques 1. Formal 2. Informal C. Plants 1. Availability 2. Cost 3. Suitability	I. Awareness of the importance of the design fitting the situation. II. Appreciates neatness and accuracy in preparing designs.

OUTLINE OF INSTRUCTIONAL CONTENT (CONTINUED)

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
	II. Procedures for developing and preparing landscape designs	

ANALYSIS

CURRICULUM: Horticulture Technology

SUBJECT AREA: Designing a Landscape

TASK: (No. P219) Select appropriate plant materials for the design.

COMPETENCY: Select appropriate plant materials for the landscape design.

CRITERION MEASURE:
1. The plant materials selected are suitable for the site selected in the design.
2. Costs of the selected plants are reasonable.
3. Plants selected are readily available.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Select plant materials.	I. Plant types A. Vines B. Groundcovers C. Trees D. Shrubs II. Plant characteristics A. Size 1. Height 2. Spread B. Form 1. Upright 2. Spreading 3. Creeping 4. Dense 5. Irregular 6. Compact 7. Climbing	I. Recognizes the need to select plants that will grow well, that are reasonable in cost and that are available.

OUTLINE OF INSTRUCTIONAL CONTENT (CONTINUED)

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
	8. Open	
	9. Broad	
	10. Other	
	C. Color	
	1. Foliage	
	2. Flower	
	3. Fruit	
	D. Texture	
	1. Fine	
	2. Medium	
	3. Coarse	
	E. Culture	
	1. Sun/shade	
	2. Soil	
	3. Moisture	
	4. Pruning	
	5. Pest problems	
	6. Growth rates	
	III. Plant uses	
	A. Shade	
	B. Enframement	
	C. Background	
	D. Boundary	
	E. Accent	
	F. Specimen	
	G. Foundation	
	H. Espalier	
	I. Groundcover	
	J. Screen	

OUTLINE OF INSTRUCTIONAL CONTENT (CONTINUED)

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
	IV. Costs V. Availability VI. Quality	

ANALYSIS

CURRICULUM: Horticulture Technology

SUBJECT AREA: Designing a Landscape

TASK: (NO.P220) Estimate labor in terms of numbers of men and hours.

COMPETENCY: Estimate labor requirements for specific jobs in terms of number of workers and hours.

CRITERION MEASURE: The number of workers and the total number of hours required to complete specific jobs are accurately estimated.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Calculate the number of workers and the number of hours required to complete horticultural jobs.	I. Factors in estimating labor requirements A. Type of job B. Location C. Type of work (machinery versus hand) D. Equipment E. Materials F. Other II. Procedures for making accurate labor estimates in terms of men and hours	I. Realizes the importance of the accuracy of the estimate.

ANALYSIS

CURRICULUM: Horticulture Technology

SUBJECT AREA: Designing a Landscape

TASK: (No. P221) Prepare cost estimate of plan.

COMPETENCY: Prepare cost estimate of the Landscape design plan.

CRITERION MEASURE: Cost estimate is correctly and thoroughly prepared for a landscape job.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Prepare cost estimate.	I. Costs A. Consultation fees B. Surveying C. Design D. Materials E. Labor F. Equipment G. Other	I. Realizes the importance of the accuracy of the estimate.
	II. Procedures for preparing a cost estimate	II. Demonstrates self-reliance in working independently.

ANALYSIS

CURRICULUM: Horticulture Technology

SUBJECT AREA: Professional Improvement

TASK: (No. Q222) Be familiar with various professional and trade associations and make decision about membership in these organizations.

COMPETENCY: Identify and select appropriate professional associations for membership.

CRITERION MEASURE:

1. Horticulture professional associations are correctly identified.
2. The purposes and activities of each professional horticulture association are correctly listed.
3. Procedures for joining various professional associations are listed.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Identify horticulture associations.	I. Identification and obtaining information about horticulture associations A. Trade publications B. Professional magazines and journals C. Horticulturists D. Constitution and by-laws of associations E. Members of associations F. State extension services G. Other	I. Joins associations that meets individual needs.
II. List purposes and activities of each association.	II. Procedures for joining various professional associations	II. Participates actively in associations that are joined.
III. List procedures for selecting appropriate horticulture associations for membership.		III. Provides information about associations to prospective members.

ANALYSIS

CURRICULUM: Horticulture Technology

SUBJECT AREA: Professional Improvement

TASK: (NO. Q223) Be aware of how and where to find current information on plant diseases, pesticides, new plants and varieties, insects, equipment, etc.

COMPETENCY: Locate information on plant diseases, pesticides, new plants and varieties, insects, equipment, etc.

CRITERION MEASURE: Information on plant diseases, new plants and varieties, insects, chemicals, equipment, etc. are correctly and efficiently located.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Locate information.	I. Information sources A. Trade magazines B. Professional publications C. Scientific publications D. Extension agents E. Books F. Horticulturists G. Manufacturer's manuals H. Equipment dealers I. Professional organizations J. Other	I. Realizes that keeping up-to-date on horticultural information is very important. II. Subscribes to several professional publications and makes them available to other workers in the business establishment.

ANALYSIS

CURRICULUM: Horticulture Technology

SUBJECT AREA: Professional Improvement

TASK: (No. Q224) Have knowledge of and subscribe to various professional and trade publications.

COMPETENCY: Identify and subscribe to various professional and trade publications.

CRITERION MEASURE:
1. Professional and trade publications are correctly identified.
2. The type of information found in professional and trade publications is listed.
3. Procedures for subscribing to professional and trade publications are listed.

OUTLINE OF INSTRUCTIONAL CONTENT

SKILL/PROCESS	KNOWLEDGE/THEORY	VALUE/ATTITUDE CONCEPTS
I. Identify professional and trade publications.	I. Identification of professional and trade publications A. Horticulturists B. Professional organizations and associations C. Books D. Reference lists E. Equipment dealers F. Extension agents	I. Realizes that professional and trade publications enable individuals to keep up to date.
II. Determine the type of information found in professional and trade publications.	II. Types of information found in professional and trade publications A. Research B. Book reviews C. Description of businesses and application of various principles	II. Subscribes to the professional and trade publications that provide information related to the type of business operated.
III. List procedures for subscribing to various professional and trade publications.		

Outline of Instructional Content (Continued)

Skill/Process	Knowledge/Theory	Value/Attitude Concepts
	D. Equipment use and repairs E. Management practices F. Time and money-saving ideas G. Chemical use and application H. Up-to-date information I. Other III. Procedures for subscribing to professional and trade publications	

APPENDIX G

SUGGESTED EQUIPMENT

HORTICULTURE TECHNOLOGY CURRICULUM

20 Students

Quantity	Description	Cost of Item	Total
20	Drafting tables, complete	600.00	12,000.00
20	Drafting stools	50.00	1,000.00
4,400 sq. ft.	Various greenhouse construction types, complete and installed, with headhouse	70,000.00	70,000.00
2	Axes	12.00	24.00
10	Bar, planting	15.00	150.00
5	Barrow, wheel	50.00	250.00
20	Boards, drawing	20.00	400.00
12	Cable, electric heating	30.00	360.00
2	Cover, plastic	25.00	50.00
20	Drawing Instrument sets	40.00	800.00
2	Duster	50.00	100.00
6	Fork, manure	9.00	54.00
6	Fork, spading	8.50	51.00
1	Germinator, seed	200.00	200.00
6	Goggles	5.00	30.00
10	Grafting Tool	3.50	35.00
1	Gun, tree-marking	35.00	35.00
4	Hatchet	7.50	30.00

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Quantity	Description	Approximate Cost of Item	Total
6	Hook, Bush	10.00	60.00
2	Kit, plant tissue	6.00	12.00
3	Lantern, Melter	15.00	45.00
1	Mask, face-organic vapor	100.00	100.00
3	Mattock	8.00	24.00
6	Nozzle, hose	3.00	18.00
1	Planimeter	150.00	150.00
6	Planter, bulb	10.00	60.00
10	Rake, garden	6.00	60.00
10	Rake, landscape	14.50	145.00
10	Rake, lawn and leaf	6.50	65.00
5	Respirator-chemical filter	12.00	60.00
1	Rotary tiller	1,000.00	1,000.00
20	Scales, architect	2.00	40.00
10	Stone, oil	3.00	30.00
10	Shovel-round point	8.00	80.00
10	Shovel-square point	7.00	70.00
1	Sieves, Seed	100.00	100.00
1	Sower, seed and fertilizer	15.00	15.00
1	Sprayer, power	1,500.00	1,500.00
10	Sprayer, hand	50.00	500.00
1	Sprayer and fire pump	50.00	50.00
4	Sprayer, Rose	6.00	24.00
20	Templates, landscaping	5.00	100.00

Quantity	Description	Approximate Cost of Item	Total
2	Thermometer, indoor-outdoor	8.00	16.00
1	Thermometer, wall utility	3.50	3.50
4	Thermometer, maximum-minimum	14.00	56.00
6	Thermostat	17.00	102.00
2	Tires, rotary tiller	25.00	50.00
40	Triangles	3.00	120.00
20	Trowel	5.00	100.00
20	T-square	10.00	200.00
1	Ladder, extension	45.00	45.00
1	Ladder, step	12.00	12.00
1	Seed scale	100.00	100.00
1	Respirator, with shield	50.00	50.00
10	Mattock, tree planting	15.00	150.00
2	Hook, Briar	5.00	10.00
10	Bag, tree planting	10.00	100.00
2	Spreader, lawn	100.00	200.00
4	Auger	8.00	32.00
4	Bulb for artificial pollination	2.00	8.00
10	Paint can	7.00	70.00
5 sets	Tree surgery gouges	9.00	45.00
5 sets	Tree surgery chisels	10.00	50.00
4	Tree wound cleaner	3.00	12.00
4	Tree scraper	5.00	20.00
4	Mallet, round	5.00	20.00

Quantity	Description	Approximate Cost of Item	Total
1	Gauge, rain	15.00	15.00
1	Increment borer	86.00	86.00
1	Tree caliper	15.50	15.50
6	Abney level	55.00	330.00
5	Steel tapes, various lengths	50.00	250.00
6	Measuring Wheels	20.00	120.00
20	Flower or plant press	12.00	240.00
10	Hose, various sizes	15.00	150.00
12 sets	Couplings	1.50	18.00
1	Liquid fertilizer proportioner and injector	500.00	500.00
4	Mist-A-Matic system, complete	140.00	560.00
18	Nozzle, split connector	6.00	108.00
4	Fan, Turbulator	100.00	400.00
6	Hozon, Spa Fast, 3' suction tube	6.00	36.00
10 pr.	Kneeguards	4.00	40.00
20	Aprons	7.00	140.00
12	Water breaker	2.50	30.00
2	Vibra-seeder	5.00	10.00
10	Dibbles, with board	2.00	20.00
2	Watering can	15.00	30.00
20	Knives, budding, grafting and pruning	7.50	150.00
2	Stapling tacker gun	16.00	32.00
2	Fumigun soil injector	100.00	200.00
1	Power shredder	260.00	260.00

Quantity	Description	Approximate Cost of Item	Total
1	Fog-gun for insecticide application	175.00	175.00
50	Orchid hangers	1.00	50.00
6	Fan nozzles	2.50	15.00
3	Fogg-It mist nozzles	3.50	10.50
1,000 sq. yd.	Black sheer cloth, price per sq. yd.	1.50	1,500.00
2,000 sq. ft.	Sterilizing steam covers	200.00	200.00
100	"Mister 100" mist prop. nozzle	1.00	100.00
3	Applicators for methyl bromide	2.00	6.00
10 rolls	Snow fencing	50.00	500.00
10	Pruning saws	25.00	250.00
10	Curved scabbards	12.50	125.00
10	Safety saddles, leather and rope	60.00	600.00
10	Safety line with snaps	8.00	80.00
3	Ratchet brace	30.00	90.00
6	Auger bits, various sizes	9.00	54.00
100	Cypress nursery flats	.75	75.00
2	Power greensmower, complete with grass catcher	750.00	1,500.00
1	Turf spiker	700.00	700.00
1	Soil meter tester	150.00	150.00
20	Pop-up sprinklers	45.00	900.00
1	Greens turf sprayer	500.00	500.00
1	Florist refrigeration unit	4,500.00	4,500.00

Quantity	Description	Approximate Cost of Item	Total
1	Truck crane	550.00	550.00
1	Tree sling	250.00	250.00
1	Lapping machine	125.00	125.00
1	Reel, grinding machine with elevator	1,150.00	1,150.00
2	Chapin watering systems	225.00	450.00
1	Sod cutter machine	850.00	850.00
2	Unit heaters	650.00	1,300.00
1	Electric generating plant	3,000.00	3,000.00
3	Salamander heaters	150.00	450.00
1	Cutting assembly for greensmower	220.00	220.00
1	Ren-O-Thin, Ryan with 12 offset knives	250.00	250.00
1	Aerifier	325.00	325.00
1	Chain saw	300.00	300.00
1	Barrow (wood)	50.00	50.00
4	Barrow (concrete)	60.00	240.00
4	Budder	5.00	20.00
6	Cultivators, hand	2.50	15.00
1	Grader	39.00	39.00
2	Hook, potato	7.00	14.00
8	Hoe, pointed scuffle	6.50	52.00
12	Hoe, nurseryman	5.00	60.00
24	Files, steel	2.50	35.00
1	Nail tainer	7.50	7.50

Quantity	Description	Approximate Cost of Item	Total
6	Lopping shears	25.00	150.00
3	Rakes, crab grass	7.00	21.00
6	Spades, nursery	20.00	120.00
1	Scoop	12.00	12.00
10	Shears, hand pruning	8.00	80.00
10	Hedge shears	20.00	200.00
4	Sledge	15.00	60.00
4	Trimmer and saws, pole pruners	45.00	180.00
12	Pruning saws	15.00	180.00
4	Trucks, nursery, hand	125.00	500.00
1	Weight roller, steel drum	70.00	70.00
1	Vice	50.00	50.00
1	Machine, adding-electric	200.00	200.00
2	Digger, post hole	20.00	40.00
10	Soil samplers	10.00	100.00
1	pH meter	330.00	330.00
1	pH meter, pocket model	50.00	50.00
3	Herbarium case	215.00	645.00
2	Greenhouse carts	70.00	140.00
8	Series A landscape rubber ink stamps	1.50	12.00
8	Series B landscape rubber ink stamps	1.75	14.00
8	Series C landscape rubber ink stamps	2.00	16.00
8	Series D landscape rubber ink stamps	2.25	18.00
8	Series E landscape rubber ink stamps	2.75	24.00

Quantity	Description	Approximate Cost of Item	Total
6	Series P landscape rubber ink stamps	1.50	9.00
2	Series TE landscape rubber ink stamps	4.50	9.00
12	Series O landscape rubber ink stamps	1.00	12.00
18	Series SH landscape rubber ink stamps	2.50	45.00
4	Series ST landscape rubber ink stamps	2.50	10.00
20	Series PL landscape rubber ink stamps	1.50	30.00
22	Series LP landscape rubber ink stamps	1.50	33.00
32	Series AR landscape rubber ink stamps	1.50	48.00
12	Series SL landscape rubber ink stamps	1.50	18.00
2	Automatic water controller	200.00	400.00
10	Automatic water valves	40.00	400.00
40	Bubble sprinkler	25.00	1,000.00
1	Tree ladder	50.00	50.00
1	Lawn sweeper	350.00	350.00
1	Feeding needle	26.00	26.00
1	Mixer, hand	20.00	20.00
1	Lawn comber	325.00	325.00
1	Concrete mixer	500.00	500.00
1	Powerhead	400.00	400.00
1	Planting auger	90.00	90.00
1	Tapewriter	90.00	90.00
2	Reel and cart combination	35.00	70.00
1	Oscillator	20.00	20.00
1	Increment hammer with handle and leather case	25.00	25.00

Quantity	Description	Approximate Cost of Item	Total
1	Lawn Tractor	1,900.00	1,900.00
1	46" Snow Blade	130.00	130.00
1	Sod Tamper	32.00	32.00
1	Tractor w/weights and hitch	7,500.00	7,500.00
1	Backfill blade	300.00	300.00
1	Disk Harrow w/hitch	450.00	450.00
1	Loader	900.00	900.00
1	Bucket w/hitch and adapter	300.00	300.00
1	Utility Trailer	600.00	600.00
1	Tractor Mounting Frame with/front and rear cultivators and fertilizer attachments	800.00	800.00
1	Mold Board Plow	350.00	350.00
1	Pull Type York Rake	500.00	500.00
1	Sprayer, Six Row	500.00	500.00
1	Aerator	1,700.00	1,700.00
2	Soil Treating Carts	2,500.00	2,500.00
1	Indoor waterfall	175.00	175.00
4	Powder scales	35.00	140.00
1	Pan balance scale	100.00	100.00
2	Tripod ladders	60.00	120.00
1	Tractor drawn spreader	70.00	70.00
1	Tractor mower	500.00	500.00
5	Optical tapemeasures	40.00	200.00
10	Grass hooks	10.00	100.00

Quantity	Description	Approximate Cost of Item	Total
24	Florist shears	8.00	192.00
2	Weed eaters	100.00	200.00
2	Extension electrical cords	20.00	40.00
1	Capillary mat watering system, complete	300.00	300.00
1	Water pressure gauge	10.00	10.00
10	Assorted watering extension handles	4.50	45.00
20	Assorted impact sprinklers	10.00	200.00
10,000 sq. ft.	Fabric shade for greenhouses	.15 sq ft	1,500.00
2	Automatic humidifier, complete	600.00	1,200.00
4	CO_2 generator, complete	200.00	800.00
1	Moisture meter, complete	200.00	200.00
1	Light meter, complete	225.00	225.00
10	Storage cabinets	200.00	2,000.00
5	Steel work benches	200.00	1,000.00
10	Pocket magnifier	10.00	100.00
2	Indoor lighted shelf cart complete	200.00	400.00
4	Time clocks	45.00	180.00
1	Brick saw	750.00	750.00
1	Carpenters tool chest, complete	1,200.00	1,200.00
1	Aseptic tissue culture chamber, positive pressure	1,900.00	1,900.00
1	Transfer chamber	500.00	500.00
2	Germination pads w/thermostat	40.00	80.00
1	Portable steam generator	3,000.00	3,000.00

Quantity	Description	Approximate Cost of Item	Total
12	Insect nets	150.00	1,800.00
1	Sola-Bridge soil tester, complete	250.00	250.00
1	Du-o-powder measure for temik application	35.00	35.00
12	Fertilizer containers w/lids	30.00	360.00
1	Card Rolodex	90.00	90.00
1	Tarpaulin	55.00	55.00
1	Gasoline powered filament grass and seed cutter w/accessories	750.00	750.00
1	Backhoe w/boom and bucket, w/loader	19,000.00	19,000.00
		TOTAL COST	$184,943.00

APPENDIX H

DEFINITION OF TERMS

For the purpose of clarifying the meanings of specific terms in this manual, the following words are defined:

Articulation - interrelation of different levels of education for ensuring continuous advancement in learning.

Associate in Applied Science Degree - the award given for the successful completion of a technical education curriculum.

Attitude - mental position, a feeling or an emotion toward a face of state; a predisposition to act in a certain way; a state of readiness that influences a person to act in a given manner.

Competency - sufficient judgement, skill and knowledge to perform a particular task.

Competency-Based Education - the educational process that specifies learning goals in measurable terms and requires that the learner achieve observable behavior changes in knowledge, skill and/or attitude to demonstrate competency before proceeding to more complex goals.

Competency-Based Instruction - the sequencing and modularization of curriculum into small, manageable units of instruction. The key concept is the student's ability to perform on each segment of the curriculum.

Curriculum - a course or group of courses organized in a logical sequence to meet occupational educational goals.

Diploma - an award for the successful completion of a course of study 64 to 128 quarter hour credits in length.

Educators - refer to individuals employed in educational institutions and in local, state, or federal agencies, both secondary and post-secondary.

Job Analysis - a detailed listing of tasks currently being performed by workers in a clearly defined, specific job.

Knowledge - the recall of specifics and universals, the recall of methods and processes and the recall of a pattern.

Learning Experience - an activity planned by educational institutions whereby the student can practice behavior implied by the objectives.

Occupational Survey - a procedure using mail questionnaires and/or personal interviews to gain knowledge of a community, educational interests or occupational needs to assist in planning.

Skill - the ability to use one's knowledge effectively and readily in execution or performance--dexterity or coordination in the execution of learned physical or mental tasks.

Syllabus - a course guide which includes overall and specific educational objectives; an arrangement of subject matter; learning experiences to give direction in meeting the stated objectives and texts and references. An illustration of evaluation techniques may be included.

Task - a logically related set of actions required for the completion of a job objective; also a task may be a complete job element.

Task Analysis - a study to determine the steps a worker must know and the key points of knowledge to know in order to perform a given task.

Technical Programs - consist of occupational-oriented courses and general education courses that lead to the awarding of an Associate in Applied Science Degree and prepare students for jobs in paraprofessional fields.

Understanding - the power to make experience intelligible by applying concepts and theories; the comprehension of ideas and the ability to use abstractions in particular and concrete situations.

Vocational Programs - systematic groups of courses or sequences of subjects designed to train students for skilled or semiskilled employment opportunities.

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